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The University Tradition in America—Yesterday and Tomorrow*

SUCH a gathering as this could come together only to commemorate an act of faith. This assembly honors a vision three centuries old and in so doing reaffirms an intent of perpetuating an ideal. A hundred years ago President Quincy, writing of the founding of Harvard, used these words: "On recurring to the origin of this seminary, our first feelings impel us to wonder and admire." From such admiration grew the celebration of the two hundredth anniversary; with no less reverential feeling the sons of Harvard have once again met here to mark the turn of another century.

The passage of a hundred years has enabled us to see more clearly the events which occurred between 1636 and the granting of the charter to the president and fellows in 1650. Thanks to the labors of the historians we are able to appreciate more fully than did Quincy the spirit of the founders and to understand more completely the significance of their bold plan. And with the increase in our knowledge comes a more than proportional increase in our admiration.

As you have heard, the Puritans' ambition was none other than to transplant to an untamed forest the ancient university tradition. They would be satisfied with nothing short of duplicating here in New England at least one college of Cambridge University. Carried forward by the strong tide of Puritanism, the enterprise was at first blessed with almost miraculous success. The goal might well seem to be in sight when, within twenty years of the founding, Oxford and Cambridge (then in the hands of dissenters, to be sure) recognized the Harvard degree as equivalent to their own. But many changes in both the mother country and the Bay Colony were yet to come. The enthusiasm for education in a new land waned, and even the second president of Harvard complained of those who desired "to pull down schools of learning, or which is all one to take away the oyl from the lamps, denying or withholding mainte-

* An oration delivered in the Harvard Tercentenary Theater in Harvard College Yard, September 18, 1936.

nance from them." The acorn had been planted, the young tree was alive, but its growth was slow beyond the expectation of those who had brought the seed to a wild, new continent.

In the middle of the last century, in 1867 to be exact, the head of one of the Oxford colleges, an eminent scholar and educational reformer, saw no evidence that the university tradition had ever taken root in the United States. "America has no universities as we understand the term," he wrote, "the institutions so called being merely places for granting titular degrees." Taken literally this harsh judgment is undoubtedly false, and yet I venture to think that it is not a gross exaggeration of the situation which then existed. The new spirit moving within the educational institutions of this country had not become evident to those outside the academic walls. Another decade was to pass before a university was opened in Baltimore, national in its scope, and proclaiming boldly that "all departments of learning should be promoted" . . . "and that the glory of the university should rest upon the character of the teachers and scholars . . . and not upon their number nor upon the buildings constructed for their use."

We commemorate today the daring hope of a group of determined men—a hope the fulfillment of which was long delayed; delayed, indeed, until within the lifetime of many now present here this morning. With feelings of gratitude we turn back through three centuries to pay homage to the faith that could see no obstacles and to ideals which are indeed eternal. But the real past which we salute is but yesterday. Harvard, together with all the other universities in this country, stands just beyond the threshold of a new undertaking. It is towards the future of our common enterprise that on this occasion we must direct our gaze.

The future of the university tradition in America—that is the problem that must concern all of us who are assembled here today. But what is this tradition; indeed, what is a university? Like any living thing, an academic institution is comprehensible only in terms of its history. For well on a thousand years there have been universities in the Western World. Dur-

ing the Middle Ages the air they breathed was permeated with the doctrines of a universal church; since the Reformation in Protestant countries these have undergone a slow and varied metamorphosis. But the essence of the university tradition has remained constant. From the first foundations to the present, four main streams have watered the soil on which the universities have flourished.

These ultimate sources of strength are: First, the cultivation of learning for its own sake; secondly, the general educational stream of the liberal arts; thirdly, the educational stream that makes possible the professions; and, lastly, the never-failing river of student life carrying all the power that comes from the gregarious impulses of human beings. All four streams are easily discernible bringing life to the English universities in the first half of the seventeenth century. For this reason Oxford and Cambridge flourished; and because they flourished, their sons who migrated to this strange land desired to cultivate the same sturdy tradition even in a wilderness.

The plans of President Dunster and his collaborators reveal clearly what the university tradition meant to the Anglo-Saxon world of the seventeenth century. Harvard's founders insisted on the "collegiate way of living," thus recognizing the importance of student life. They knew the educational values which arise from the daily intercourse between individual students and between student and tutor. Their concept of professional training was, to be sure, largely cast in terms of the ministry, but they envisaged also training in the law and medicine. The liberal arts educational tradition they transplanted in toto from the colleges which they had left behind. And finally, their zeal for the cultivation of learning is made evident by the reference in the charter of 1650 to "the advancement of all good literature, arts and sciences. . . ."

Such, it seems to me, was the properly balanced plan of a university in a time when universities were flourishing; such, it seems to me, must be the idea of a university if institutions of higher learning are to fulfill their proper function in the times

that are to come. But there have been periods of sickness, even of decay, in the history of almost every academic foundation. If one of the four vital streams I have mentioned either fails or swells to a torrent, thus destroying the proper balance of nourishment, then the true university tradition may perish. The cultivation of learning alone produces not a university but a research institute; the sole concern with the student life produces an academic country club or merely a football team maneuvering under a collegiate banner. On such abnormalities we need not dwell, but I should like to take a few moments to consider the disastrous effects of an over-emphasis of either the liberal arts educational tradition or the element of professional training. This is a real danger at all times. For a university nourished exclusively from either one of these two educational streams always seems to the uninformed to be most healthy because they believe it to be most useful.

Let us consider, first, the situation created when the proper balance is upset by disproportionate concern with general education. In this case the stream of learning and research inevitably dries up; indeed, some have contended that it should. Newman defined his idea of a university as "a place of teaching universal knowledge, for the diffusion and extension of knowledge rather than the advancement." In his famous essay he recommended "a division of intellectual labor between learned academies and universities." (In twentieth century terminology we should substitute the words "research institute" for "academy.") He believed that "to discover and to teach are two distinct functions." Newman's proposal amounted to eliminating one of the four vital ingredients evident in the life of the universities during their healthy periods. Unconsciously he was reflecting the condition of the English universities as he knew them before 1850 when they were still suffering from the long sleep of the eighteenth century. His proposition was in reality but a concise description of a disease.

A few years later a prominent member of his own university, recognizing the condition as pathological, expressed himself in the following words:

The colleges (of Oxford and Cambridge) were in their origin endowments for the prolonged study of special and professional faculties by men of riper age. . . . This was the theory of the university in the Middle Ages and the design of the collegiate foundation in their origin. Time and circumstances have brought about a total change. The colleges no longer promote the researches of science, or direct professional study. . . . Elementary teaching of youths under twenty-two is now the only function performed by the university, and almost the only object of college endowments. Colleges were homes for the life-study of the highest and most abstruse parts of knowledge. They have become boarding schools in which the elements of the learned languages are taught to youths.

When we read this indictment penned before the completion of the nineteenth century reform of Oxford we may well ask: If the intellectual division of labor which Newman advocated and which still finds proponents in our own time is to be desired, why were the English universities in so unsatisfactory a condition? The accidents of time had destroyed the ancient function of advancing knowledge and yet the institutions did not flourish.

As further evidence, listen to what the royal commission of inquiry into the condition of Oxford had to say on this subject in 1850.

It is generally acknowledged that both Oxford and the country at large suffer greatly from the absence of a body of learned men devoting their lives to the cultivation of science and the direction of academical education. . . . The presence of men eminent in various departments of knowledge would impart a dignity and stability to the whole institution, far more effectual against attacks from without than the utmost amount of privilege and protection.

Attacks from without—the phrase has a modern ring. Events proved that the commission of 1850 was correct in its statement, the changes which they advocated restored the confidence of the nation in its two ancient institutions. They could not foresee, however, the reluctance of certain sections of public opinion to welcome the restoration of the true university tradition. They did not realize how willingly the public often

follows those who argue for a separation of teaching and research! No better illustration could be found than an article in the London *Times* published in 1867. The writer endorses the general view that "the university is mainly a place of education for young men just before they enter upon life and should confine its whole administration to this practical aim." (Please note the word "practical"!) "We are confident," the article continues, "that this view is the one from which Englishmen in general regard the universities. It is a growing subject of discontent among the public that the tutors and professors of both Oxford and Cambridge are becoming more and more absorbed in their own scientific pursuits."

And these remarks at the time when the two ancient universities were undergoing that revolution which restored them to health and enabled them to take the position of intellectual leadership which they now enjoy! So short-sighted is often the popular reaction to matters of education. Would the English public today wish to turn back to the years when the professors and tutors rarely yielded, indeed, to the temptation to cultivate sound learning and pursue new knowledge?

There is comparatively little danger, however, that in the years ahead there will be any effective movement to turn the universities of this country into boarding schools. The cause for apprehension seems to me to lie in a different quarter. Even the most idealistic of those who lead public opinion too often insist on examining educational institutions through the dull glasses of immediate utility. To be sure the promotion of learning usually appears to be worth saving even when viewed through such an unfavorable medium. The most relentless reformers are at least partially convinced that at some time almost all research may be materially rewarding.

There is, however, a growing demand for more and more professional training, and there is a tendency to stretch the word "profession" until it comprises every vocation. The utilitarian demand for specialized vocational training and the practical man's contempt for useless knowledge go hand in hand. When such influences gain control, an institution of higher learning supplies training, not education, and the pro-

motion of learning is degraded to a vehicle for providing material well-being. The liberal arts conception of a general education disappears and with it the institution's most important contribution to the land. The universities of a country are the sanctuaries of the inner life of the nation. When they cease to be concerned with things of the spirit, they cease to fulfill their most important function.

If I am correct, then, in my interpretation of academic history, the future of the university tradition in America depends on keeping a proper balance between the four essential ingredients—the advancement of learning, the liberal arts college, professional training, and a healthy student life. None must be neglected; no one must be allowed to predominate unduly. If this balance can be maintained, the universities of this country, privately endowed and publicly supported alike, will function both as instruments of higher education and as centers for developing a national culture worthy of this rich and powerful land.

Are we capable of evolving an American civilization commensurate with our opportunities? Surely this is the challenging question of the day. This is the question which transcends in importance even the most pressing demands of our troubled post-war period. Less than a century ago many people expressed grave doubts whether learning could be cultivated in a democracy. The last fifty years have proved them to be wrong. We can be proud of what has been accomplished in this republic, but only a start has been made. We must press on with all the earnestness and faith of those early settlers whose brave aspirations we honor by our ceremonies today.

A wave of anti-intellectualism is passing round the world. We see evidences of it on every hand but it is no new phenomenon. Before Harvard was founded Bacon referred to the "objections concerning the dignity of learning which arise from ignorance, appearing sometimes in the zeal and jealousy of divines; sometimes in the severity and arrogancy of politicians; sometimes in the errors and imperfections of learned men themselves." With these sources of objections we are all familiar. But the anti-intellectualism of the present is in part

a protest—a most ungrateful protest, to be sure—against the benefactions of the learned world. It expresses a rebellion against the very triumphs of applied science, against the machines from which we would not be separated and yet towards which we feel a deep resentment. It is the expression of our weariness as we see an ever increasing wealth of new knowledge poured at our feet by the scholars of the arts and letters no less than by the scientists. Intellectual anarchy in our schools and colleges has been more or less rife for the better part of a hundred years. "Will it never end?" we are tempted to cry in despair.

To bring order out of an educational chaos is the mission of the liberal arts curriculum of our universities—that is why it is important that this ancient tradition be not overwhelmed. Those of us who have faith in human reason believe that in the next hundred years we can build an educational basis for a unified, coherent culture suited to a democratic country in a scientific age, no chauvinistic dogma, but a true national culture fully cognizant of the international character of learning. In this undertaking the schools are involved quite as much as the universities, but the latter must lead the way. The older educational discipline, whether we like it or not, was disrupted before any of us were born. It was based on the study of the classics and mathematics; it provided a common background which steadied the thinking of all educated men.

We cannot bring back this system if we would, but we must find its modern equivalent. Like our ancestors we must study the past, for "he who is ignorant of what occurred before he was born is always a child." In my opinion it is primarily the past development of our modern era which we must study and study most exhaustively and critically. We must examine the immediate origins of our political, economic and cultural life and then work backwards. We must now, however, spread the inquiry over so wide a range that the average men will obtain only a superficial knowledge. It does not seem to me to be a step in the right direction to dip our children first in one barrel of tinted whitewash and then in another. The equivalent of the old classical discipline is not to be found in a bow-

ing acquaintance with universal history and general science, and an exposure to scattered examples of art and literature. Our present educational practice which insists on the thorough study of at least one discipline is certainly sound.

For the development of a national culture based on a study of the past, one condition is essential. This is absolute freedom of discussion, absolutely unmolested inquiry. We must have a spirit of tolerance which allows the expression of all opinions however heretical they may appear. Since the seventeenth century this has been achieved in the realm of religion. It is no longer possible for some bigoted Protestant to object if any person within the universities or without expounds sympathetically the philosophy of St. Thomas Aquinas. It is no longer possible for a member of the Roman Catholic Church to take offense at a critical discussion of Galileo's trial. Statements believed to be erroneous are met openly and fairly by counter arguments. But there is no persecution; there has been an end to religious bigotry in this country, and there are no signs of its return.

Will the same conditions prevail in the future when political and economic problems are examined? Unfortunately, there are ominous signs that a new form of bigotry may arise. This is most serious, for we cannot develop the unifying educational forces we so sorely need unless all matters may be openly discussed. The origin of the Constitution, for example, the functioning of the three branches of the federal government, the forces of modern capitalism, must be dissected as fearlessly as the geologist examines the origin of the rocks. On this point there can be no compromise; we are either afraid of heresy or we are not. If we are afraid, there will be no adequate discussion of the genesis of our national life; the door will be shut to the development of a culture which will satisfy our needs.

Harvard was founded by dissenters. Before two generations had passed there was a general dissent from the first dissent. Heresy has long been in the air. We are proud of the freedom which has made this possible even when we most dislike some particular form of heresy we may encounter.

In a debate in the House of Commons, Gladstone reviewed the history of Oxford and spoke of the lamentable condition of that institution during the reign of Queen Mary. Quoting a historian of that period he continued: "The cause of the failure is easy to discover. The universities had everything, except the most necessary element of all—Freedom: which by the immutable laws of nature, is always an indispensable condition of real and permanent prosperity in the higher intellectual cultivation and its organs." With this conclusion all who cherish our heritage must agree: Without freedom the prosperity most important for this country cannot be achieved—the prosperity of our cultural life.

The university tradition in this country has been sustained through three centuries by the courage and sacrifice of many men. An ever-increasing number of benefactors have followed John Harvard's example. Patrons of learning have not only favored Harvard with their gifts, but have established and aided other universities throughout the nation. In cities and states institutions have been founded and supported from the public funds. In all our colleges learned men have labored with little material reward to "advance learning and perpetuate it to posterity." Teachers of the young have so lived their lives that the coming generations might be inspired with a love of wisdom. All this devotion on the part of those concerned with higher education stands as a clear witness to the significance of what was here envisaged three hundred years ago. He who enters a university walks on hallowed ground.

If we attempt to sum up in one phrase the aim of higher education, we can do no better than to speak of "the search for the truth." A little more than a hundred years ago when President Quincy was exploring the Harvard archives, he came upon the early record book in which is the famous drawing of the Harvard seal as specified by a vote of the overseers in 1643—the open books with the word "Veritas." Delighted by his discovery Quincy restored Veritas to the college arms, but it was not until 1885 that this word found a permanent place upon our seal. To me there is an arresting symbolism in this bit of apparently accidental history. It is significant that

the Puritan founders chose the word Veritas, for this word is the touchstone of the real university tradition. And it is fitting that the original seal was finally re-adopted just when Harvard was developing into a great modern university.

When the Puritans wrote Veritas upon the open books, they had in mind two paths by which truth could be obtained: One, Revelation as interpreted with the aid of human reason; the other, the advancement of knowledge and learning. Bacon expressed the spirit of the age which was to follow when he declared that a man cannot "search too far or be too well studied in the book of God's word, or in the book of God's work, but rather let men endeavor an endless progress or proficience in both." In the present century a French mathematician wrote, "The search for truth should be the goal of our activities; it is the sole end worthy of them. . . . If we wish more and more to free man from material cares, it is that he may be able to employ the liberty obtained in the study and contemplation of truth. . . . When I speak of truth," he continued, "I refer to scientific truth but also moral truth of which what we call justice is only one aspect. . . . Whosoever loves the one cannot help loving the other."

This same thought was expressed by President Eliot in an address in 1891 which stands as a challenge to our time. Speaking of a university as a "society of learned men," he defined their goal as "the incessant, quiet, single-minded search after new truth, the condition for both the material and intellectual progress of the nation and the race." The intellectual progress of the race—during the coming century of academic history what gifts will the American people bring to further this great advance? A hundred years from today the record will be read. With humility but with hope we look forward to that moment. May it then be manifest to all that the universities of this country have led the way to new light, and may the nation give thanks that Harvard was founded.

JAMES BRYANT CONANT,
President, Harvard University

Science in an American Program for Social Progress*

THE rôle which science has played in social progress is nowhere more succinctly set forth than in the preamble to resolutions adopted by the American Association for Advancement of Science, and submitted to the President of the United States in December, 1934:

WHEREAS, Development and application of science have been basic to the economic and social progress of nations, making possible such movements as universal education, abolition of child labor and slavery, emancipation of women, insurance and pensions, moderate hours of labor and great improvement in the standards of health, comfort and satisfaction in living; and

WHEREAS, Scientific developments have not only conferred general benefits, but in particular have been largely effective in leading to recovery from previous depressions—as the railroad industry following the depression of 1870, the electric industry following that of 1896, and the automobile industry following that of 1907; and

WHEREAS, Scientific research is a productive investment proven by experience to yield a high rate of return, as illustrated by the saving of $2,000,000,000 per year from the Bessemer steel process and of over $1,000,000 per day from the modern incandescent lamp, and as illustrated also by the entire chemical, electrical, communication, transportation and metallurgical industries and by the enormous employment in such industries; . . .

That our national health, prosperity, pleasure, and indeed our very existence, depend largely upon science for their maintenance and their future development, no informed person would deny. Within our generation this truth has been emphasized, for we have come to the end of free expansion by migration westward, and of free exploitation of ever newly discov-

* An address delivered before the National Industrial Conference Board in New York, May 28, 1936, as part of a symposium on "The Elements of an American Program for Social Progress."

ered resources of soil and minerals. We have reached the point beyond which further increase in our wealth, population, physical comfort, and cultural opportunity will depend not on discovering new resources by geographical exploration but by wiser use of the resources that we now have, through scientific exploration.

This idea is not new, but I doubt if we realize its profound significance; it marks a turning point in the history of the world! How did the Egyptians, the Greeks, and the Romans secure their wealth? By plunder and taxation of conquered nations and by "labor-saving" production through the work of enslaved peoples. How were the great commerce and wealth of England acquired? Through geographical exploration, conquest and colonization of virgin lands with such returns in wealth as we find it hard now to comprehend. For example, the profits of the British East India Company were of the order of 100 per cent on each voyage of its merchantmen.

Now all livable portions of the world are settled and closely interconnected by travel and trade. Probably the Italian conquest of Ethiopia and Japan's expansions into China are about the ending of the centuries old struggle for wealth through territorial conquest. In our own country, Horace Greeley's advice "Go West, young man, go West," no longer has its original significance. The geographical pioneer is now supplanted by the scientific pioneer, whose thrill of discovery or urge for reward is no less keen and whose fields of exploration are probably unlimited. Without the scientific pioneer our civilization would stand still and our spirit would stagnate; with him mankind will continue to work toward his higher destiny. This being so, our problem is to make science as effective an element as possible in our American program for social progress.

Practically all scientific work in the United States is carried on under one or another of three auspices: the government, industrial organizations, and educational institutions or similar altruistic foundations. The scientific services of the federal government are spread through forty bureaus, of which eighteen are primarily scientific. There are about 630 colleges and universities in the United States, including 155 engineering

schools. There are upwards of 1,600 research laboratories operated by industrial companies. Watson Davis, of Science Service, recently estimated the total annual national expenditure in scientific research work as about $100,000,000, divided roughly equally between government, educational institutions, and industry. Each of these three categories of scientific work has its proper scope, limitations, and opportunities. Each has its peculiar problems of operation. I will proceed, therefore, to discuss them separately.

SCIENCE IN GOVERNMENT

During the two and a half years of its existence, terminating last December, I had the extraordinary opportunity to serve as chairman of the Science Advisory Board, under which, with its subcommittees, more than a hundred of the country's ablest scientists and engineers gave free and devoted service to the scientific interests of the government at the request of the President. Out of this experience I could draw a kaleidoscopic picture of the scientific work of the government: work of vast importance to the welfare of the country; staffed by an army of able scientists single-mindedly devoted to their respective jobs; financed by less than half of one per cent of the total governmental budget; replete with duplicating and unco-ordinated effort; subject to the charge that many projects are started but few are ever stopped; with partisan loyalties to bureaus and departments continually blocking attempts at changes in organization even when there is no disagreement as to the improved efficiency that would thereby be gained; with almost no executive officers, more permanent than the current administration, to co-ordinate the various bureaus, direct their programs, and plan their future; yet with sincere and often courageous concern on the part of department secretaries for the efficient working of the bureaus under their jurisdictions; and under all these conditions a surprisingly effective service—these are some of the facets of this kaleidoscopic picture. (I except the two military departments, which are organized on a more permanent basis.)

This is not the occasion to discuss the specific problems

which were referred to the Science Advisory Board—which were technical problems of organization, scientific programs, budgets, or personnel. Suffice it to say that there was generally good co-operation from high officials from the President down and that there was much actual accomplishment, reflected in the present and pending operations of a number of the scientific bureaus, despite regrettable failure to achieve results in some important matters. But of greater significance than these specific jobs was the development in the minds of the Board of a certain conception of the rôle of the government in science which I cannot present better than by quoting certain passages from the final report of the Science Advisory Board to the President:

An absolute prerequisite to (our national) welfare, independent of political theories and basic to attempts at national planning or improvement of any kind or degree, is adequate scientific information regarding the materials and forces with which great groups of our population have to deal. This is the justification for the existence of scientific bureaus in the Government.

In a democracy like ours, designed to safeguard personal liberty and to stimulate individual initiative within the framework of "general welfare," there is no need for the Government to embark upon comprehensive programs in pure science, invention, or industrial development. There are, however, numerous scientific services of such wide scope and universal utility that no agency except the Government is competent adequately to handle them. (In this category are public health, weather forecasting, topographic mapping, development of scientific and technical standards, mineral surveys and statistics, safety codes, patents, soil science, improvement of crops and live stock.) There are other scientific services which are essentially supplementary to non-scientific governmental activities. (Among these are engineering work relating to flood control, water supply and aids to navigation; scientific aids to national defense; development of standards for the purchasing of supplies for use of governmental bureaus.) There are also fields of scientific or technical development which hold evident promise of benefiting the public but which are not proper nor practical fields for private initiative (such as the activities of the National Advisory Committee for Aëronautics, and the financial aid to land-grant colleges for development of agricul-

ture and engineering arts.) In these three categories and in this order of importance lie the proper scientific activities of the Government.

The first scientific bureaus to be established had to concern themselves but little with the co-ordination of their programs. Each filled a definite need and its purpose was to gather facts in a designated field. (These Federal services, however, have expanded enormously with the increasingly complex demands of our civilization.) Side by side with the growth in the number of bureaus and in the multiplicity of their functions, there should have been applied (more rigorously) the principle of co-ordination of related work, no matter in what bureaus the work may be done. (This is a primary requisite for efficiency.)

Freedom of scientific work from political or policy-making influences is a second prime consideration. Whatever the trend of social or political thought and whatever the degree of national planning, the people of the country have the right to expect that the scientific services are always free to report and interpret the facts in a given field of enquiry as they find them and not as the government of the day may wish to have them reported or interpreted. They should be free to produce results that are not discolored by the opinions and snap judgments of policy-making political groups who may wish to put the dignity of "science" behind their plans in order to win public approval.

Over and above the work of particular scientific bureaus, there is increasing activity on the part of the Government in undertaking large projects whose feasibility or justification are matters for technical decision from many points of view: scientific, economic, humanitarian. Examples of such projects are: irrigation, power development, flood control, soil erosion control, shelter belt, waterways, retirement of sub-marginal land and colonization. Where huge sums are involved and large groups of people affected, it is more than ever necessary that decisions and policies should be settled only after the most thorough, competent, and disinterested study of such questions as: Is the project technically feasible? Will it accomplish its purpose? What are the alternatives, and has the best plan been selected? Will the benefits justify the expenditure? For technical advice on such questions, Congress and the Executive Departments should have ready access to, and should use, the best talent available both within and outside of the government services.

It is (therefore) the concern of every citizen that there be

available to government the most competent and impartial advice which can be found. The endurance of our traditional form of government will depend in increasing measure upon the quality of expert judgment, tempered with experience, which is available to government, and the willingness of government to follow such judgment.

Considerations like these led the Science Advisory Board to recommend to the President the permanent establishment of a scientific advisory council, its members to be nominated by the National Academy of Sciences and to serve without pay, but with provision for necessary travel and secretarial expenses. This council would be enabled to appoint subcommittees on the principal scientific bureaus. The duties of this group would consist, first, in assisting the bureau chiefs to formulate general programs and policies; second, in promoting co-ordination and working against improper duplication of effort of the various bureaus; third, in interpreting, criticizing, or defending the work and plans of the bureaus before the responsible department secretaries and congressional committees; fourth, in giving to the director of the budget its critical and independent judgment (advisory only) regarding budgets and requests for appropriations for scientific work in the non-military departments.

It is my conviction, shared by my engineering and scientific colleagues who have studied the situation during the past three years, that some such plan would be feasible, and that it would do more to increase the efficiency and the prestige of the federal scientific services than can be achieved in any other way. It may be that thought of such an independent and sometimes critical advisory service is not relished by any official who is more concerned with maintaining his unlimited authority than with ensuring efficient conduct of the people's business for which he is responsible. But when I heard a high official say that "of course the plan is impractical," I thought to myself that this only means that he and some of his colleagues do not like it. Plans similar to the one here proposed have been in successful operation in several European countries in recent years. In Great Britain, for example, a group of the Empire's

greatest scientists act as official advisers to the privy council on all questions of programs and budgets for scientific work under governmental auspices.

SCIENCE IN INDUSTRY

Turning now to industry, we have no difficulty in defining its proper scope of scientific research: that type of research is justified which shows reasonable promise of producing better products, or desirable new products which can be made and sold with profit, or of reducing the cost of existing products. Within this simple definition, however, lies great scope for informed judgment, courage, and skill in the decision as to "what constitutes reasonable promise?" and "how great is this promise in comparison with the probable cost?" It is the action on such questions that largely determines the future growth or decay of an industry.

Experience has convinced progressive industries that as much as several per cent of income can profitably be spent on research. This expenditure is both an investment for future dividends and an insurance against future loss through obsolescence or more enlightened competition. Dr. Robert A. Millikan emphasized the investment aspect when he said: "Research pays because you know what you want, go after it with informed brains by the scientific method, and in general get it. But it often yields (extra) dividends because you get something more that you didn't go after." And Francis Bacon, over 300 years ago, described the fate of the industry which neglects research when he wrote: "That which man altereth not for the better, Time, the Great Innovator, altereth for the worse." The statement is not unusual which was made a few years ago by the president of a great manufacturing company when he told his stockholders that 60 per cent of sales that year had been of products that ten years before were unknown.

Several years ago the National Research Council compared the financial health of industries, as a function of their activity in research, as measured for example by relative expenditures for research. At the top were such industries as the chemical, electrical, communications, and automotive; toward the bot-

tom were railroads, lumber, and textiles. The correlation between support of research and financial prosperity was decidedly striking, and has been an effective object lesson.

In any attempt to make science more effective in industry and through it more helpful to the public, certain obstacles must be met and overcome.

First I would mention the so-called "hard-headed, practical business man;" a man without vision, imagination, or enthusiasm for new things; a man who scoffs at theory or a college degree; a man whose sole criterion of proper practice is that which he has been accustomed to in the past; a man who spends as little as he can on research in order that his profits day by day may be larger. The withering policies of such men have driven many a flourishing business into obsolescence. If, by accident, a research laboratory has been set up in this man's company, its staff will be among the first to be fired in a depression, thus saving temporarily dollars but losing permanently the capital investment in trained intelligence.

In this same class I would place that type of control, sometimes exercised by a financial group, which focuses attention on the profits of the current year to practical exclusion of developing strength for the future. I see many examples of this, in which the organization has become so weakened by the time it sees its mistake that it has not the strength to embark on a different course, and therefore continues to become sicker and sicker. One species of this type of business anemia arises when the cost accountant becomes the master instead of the servant, applying cut-and-dried methods of evaluation, on a monthly or yearly basis without discrimination and without realizing the values which may reside in a research, a big idea, or an active brain.

From these two examples, which I have purposely stated strongly, you may infer that I advocate the growing tendency to give technically trained men an increasing share in the management and policy-making activities of industry—and I do not mean to infer that financially trained men are not also essential.

A second obstacle is the cost, delay, and uncertainty in the

operations of our out-moded patent procedures. This is one of the major hindrances to the development of new industries and the supplying of new employment through the results of science. It is greatly to be hoped that favorable action will be taken by Congress on several recommendations by the Science Advisory Board aimed at increasing the presumptive validity of patents and the accuracy and ease of decisions by the courts.

A third obstacle is found in the increasing regulatory activities of the government for the stated objective of protecting the public, but sometimes in the nature of disastrous boomerangs. I believe that an increasing degree of regulation of business for protection of the public is a necessary accompaniment of increasing general complexity and competition. But this regulation should be benevolent and intelligent, two characteristics which are not as prevalent as they should be. A fundamental difficulty appears to reside in the fact that in general we are governed by politicians rather than by statesmen. By this I mean that our elected rulers are generally men of alert perception to public opinion, nimble in debate, persuasive in oratory, and skilful in dealing with group psychology; but these excellent qualities do not necessarily fit them to make wise decisions in such questions as: What technical procedure of subsidies, or curtailed planting, or research to create new industrial uses for his products, will best help the farmer and at the same time the country as a whole? or, Is a public utility company justified in charging on its bills to today's customers part of the cost of research designed to improve or cheapen the service to tomorrow's customers? These are profound questions, which greatly affect the ability of science to promote our social welfare. Our present method of deciding such questions is frequently expensive, illogical, or ludicrous and is sometimes disastrous. However, while recognizing this difficulty, I can offer no solution to it and am unable to prove that we do not have the best of all possible types of governments in the best of all possible worlds, in the long run. Thus I will mention the government no more except to point out that its present attitude toward both industry and science is in unflattering contrast with that

of several European countries which have helped industry in a positive way by offering it definite incentives to embark upon a more active program of scientific and industrial research, considering this to be a national investment for future prosperity and employment.

SCIENCE IN EDUCATIONAL INSTITUTIONS

In educational institutions, science has no limitations in search for truth except those imposed by availability of ideas, workers, facilities, and funds. Such institutions have always been the places where the great bulk of new discoveries are made and ideas born, and this will continue to be so since there exist no other organizations where such studies can be similarly pursued. The practical aims of educational institutions in science are well described by Dr. Isaiah Bowman: "The trade school exists for the admirable purpose of putting practically trained men into jobs; the university exists, among other things, to create and expand the sciences that provide the jobs. It is in engineering that these two points of view are effectively joined."

The fact that the universities and engineering schools do feed industry with most of the new ideas, which industry then transforms into products of social value, was illustrated by Dr. Roger Adams in his recent presidential address before the American Chemical Society when he said, "The basic and fundamental information for over 95 per cent of the industrial processes has been originally discovered and described by the university investigator." I recall a statement written by Herbert Hoover, when he was secretary of commerce, in which he expressed concern lest the industrial supremacy of America should be lost because our industrial leaders were not actively enough concerned with laying the foundations for the industrial future by strongly supporting pure scientific work at the present time. Mr. Hoover not only believed this but he worked to bring about increased support of pure science by industry until the presidency brought him new and greater problems.

Growth of industry and employment, and gain in civilization through science are like the growth of plants in Nature:

of many seeds which are scattered, only a few grow to be vigorous plants; but if no seeds were produced and scattered there would be no plants at all. Scientific discoveries are the seeds of industry and public welfare, and the universities are the nurseries in which they are produced and nurtured to the point where some of them can be transplanted into the fields of industry. I once likened new industries to babies—they need shelter and nourishment, which they take in the form of patent protection and financing. But, before all, they need to be born, and their parents are science and invention. Neither laws, nor committees, nor juggling acts, nor wishful thinking can perform the first necessary step of conception. To maintain and advance our civilization we need more and better scientific seeds and industrial babies. The educational institutions of higher learning are the birthplaces of this new knowledge, as well as the training and proving grounds for the young men and women who will carry this knowledge on and put it to practical use.

In discussing this matter with my friend Dr. Charles F. Kettering a couple of weeks ago, he expressed the opinion that one of the major problems of both industry and the universities is to facilitate this production and nurture of the seeds of industrial progress in the universities, and to narrow the gap and hazard between discovery and successfully launched business. To do this requires closer co-operation between industry and educational institutions, involving more active research programs in the institutions, their more generous financial support by industry or by the captains of industry, and closer personal contacts between the men in the two groups who have related interests.

My own observations of what can be accomplished in an educational institution like the one which I represent convince me that there are really great opportunities along these lines. I have seen the sprouting of literally hundreds of promising ideas; I have seen the co-operative effort of professorial chemists, physicists, electrical engineers and metallurgists solve serious industrial problems that had baffled the skilled practical men of industry; I have seen a little of the desired financial

support; and I have seen productive mutual stimulation in such co-operation. As I see it, a great university or engineering school already possesses, because of its teaching responsibilities, the principal overhead of staff, facilities and administrative organization necessary for a large research program, so that relatively large returns in the fields of research and development can be secured with relatively little additional financial support. It is in this direction that there lies, in my judgment, the greatest opportunity for increased contributions to public welfare through science in the leading educational institutions, and thus far the surface has only been scratched. I believe that, with more adequate financial support, a new order of institutional public service will be possible.

One peculiarity of scientific research is that its results can usually not be foreseen, for if they could be foretold they would not be new. Also, when a new discovery is made, it is not usually immediately obvious as to the possibilities of its practical uses. And again, the solution of a scientific problem may be a long, hard struggle—longer than was realized by a visitor who asked Harvard's President Conant what he was doing in his laboratory. When Conant replied, "We are seeking to discover the chemical formula for chlorophyl," his visitor exclaimed, "Why, how is that? You were working on that problem when I was here last year!"

Because of these uncertainties I cannot tell you just what the next big scientific developments will be, but I can assure you that they will come and that they will be important. Among the fields that seem to me to show especial promise are: development of new industrial uses for farm products; improvements in transmission and utilization of electric power; great developments in materials and methods of building construction; increased range and precision of weather forecasting; conquest of hitherto unconquered diseases, both physical and mental; better regulation of bodily functions; a new era in biological discovery operating with the tools of physics, chemistry and engineering; and a similar new era in physical science centered around atomic nuclear transformations. The field is literally limitless.

Having thus suggested a few of the more significant ways in which science may be made to contribute more effectively to the American Program for Social Progress, through the agencies of government, industry and education, I close by saying that the greatest of all contributions of science is not to be found in the comforts, pleasures, or profits which flow from it, but in the freedom and imagination which it has brought to the human spirit and the sense of relationship and unity in the world. Of all descriptions of the true spirit of science I like best the words of the ancient Greek philosopher, Aristotle, which appear engraved on the beautiful home of the National Academy of Sciences in Washington: "Search for truth is in one way hard and in another way easy, for it is evident that no one can master it fully nor miss it wholly, but each adds a little to our knowledge of Nature, and from all the facts assembled there arises a certain grandeur."

KARL T. COMPTON,
President, Massachusetts Institute of Technology

History and Education*

THE French philosopher Voltaire is said to have ended a letter to a friend with the following words: "Excuse my writing so long a letter, but I had not time enough for a short one." I was reminded of this story when Dean Holmes asked me to deliver a short speech on the history of education. This problem actually involves the whole question of the value of history, and it would be easier to deal with the subject in a long course of lectures. This all the more since, according to tradition, German scholars need at least one lecture for an introductory examination of the philosophic pre-suppositions necessary for an adequate treatment of their subject. But, as a matter of fact, every great nation must plead guilty to having contributed an enormous amount of literature to the problem just mentioned.

Fortunately there remains against those writers who have advocated the study of history in voluminous works the short but impressive and well known dictum of a great American industrialist, who said: "History is bunk." Very few ideas in this world are really new; and this man's opinion was also foreshadowed in some very respectable works of literature, especially in the works of Jean Jacques Rousseau and Friedrich Nietzsche. And even the great German poet Goethe anticipated Mr. Ford. It is doubtless a feeling of the too heavy weight of the past which led him to compose the epigrammatic poem:

Amerika, du hast es besser
Als unser Kontinent, das alte,
Hast keine verfallene Schloesser
Und keine Basalte.
Dich stoert nicht im Innern,
Zu lebendiger Zeit,
Unnuetzes Erinnern
Und vergeblicher Streit.

* An address delivered at the Tercentenary Dinner of the Alumni Association of the Harvard Graduate School of Education, September 17, 1936.

And since Goethe told one of his friends that he had always hated to learn anything which enlarged his amount of knowledge without simultaneously enriching his inner life, he also might have been tempted to use the word "Bunk" if he had listened to the sort of historical instruction and sentimental lingering in the past that we still observe in many of our classrooms today and in many of our political assemblies. Now the thinkers whom I mentioned, in spite of their protests against conventional education, were perhaps still too much influenced by books and schoolmasters to formulate their opinions on history so briefly, so courageously, and so illuminatingly as the great American. But if we try to simplify their ideas according to the modern manner of telegrams and advertisements, we could perhaps say, not exactly "History is bunk," but rather "History is a danger." It is a danger if it turns our thoughts exclusively back to the past and leads us into a dreamland where, under the pretext of reverence for our ancestors or the pretext of historical research, we may forget our obligations and duties amidst the conflicts of the present. History is a danger if it helps to retain customs and opinions which are no longer relevant to the demands of a living society, but which are relics of periods outlived; and history is a danger if it supports groups which have greater interest in traditions than in the constructive and forward-looking ideas of their own time.

What, then, gives us the right to advocate historical instruction not only for the training of teachers but also in the field of education generally?

All narrow-mindedness is largely due to a lack of the sense of comparison. A man who has the opportunity for comparing his own manner of living, his habits, his customs and his institutions with those of other peoples and nations, will no longer think that the way in which they prepare the chicken and the apple pie at his own home is the only legal way of preparing chicken and apple pie. Some have more apples and less pastry, and others have more pastry and fewer apples. Some like pie with whipped cream and others with ice cream,

and some even like pie with cheese, a habit which proves to me —in addition to my difficulties with the English language and in spite of my reverence for American customs—that I am not yet completely Americanized. Now, since there are few educators who have the opportunity—and the money—to travel in other countries and to compare the way in which they prepare and serve up the bounties of civilization to the younger generation with the similar attempts of their neighbors, we have introduced into the curriculum of the more advanced institutions for the training of teachers the subject of Comparative Education. Comparative education is the theoretical substitute for the modern educator of what our ancestors called the "grand tour" or the "Bildungsreise." Provided they had the fortune and the social standard, they would send their sons at the age of twenty to foreign countries, introduce them to families of culture and experience, and expect that they would come back, not only with refined habits, but also with a broader knowledge of the world, and perhaps also with certain acquaintances which helped the young gentleman not to go entirely unprepared into the later experiences of married life, for which sort of education of the youngsters the city of Paris and other capitals had provided a considerable amount of charming opportunity. For this kind of education, I am sorry to say, our modern comparative courses can not yet provide the necessary opportunities.

The "grand tour" or "Bildungsreise" was one of the prerequisites which the German philosopher and statesman Leibnitz, writing after the Thirty Years War, demands in his interesting treatise on the training of jurists and diplomats. And though the writer was very young himself, he recommended to the travelers, should they intend to discover diplomatic secrets or secrets of trade, that they come to good terms with the servants and chamberlains of influential men and eventually bribe them. You have perhaps heard that in earlier times and in different political structures bribes played a very great rôle, particularly in the securing of public positions. Our courses in comparative education do not supply

suggestions like these. But here we have no reason to be sorry, since our public and political life has so far improved that even to speak of bribes would mean to refer to events in the remote past which have no connection with our own times!

When a young man with certain aspirations went on his great tour, he not only intended to study the present conditions in the different countries, but in order to understand better what he was going to see he studied carefully the history of the nations he was going to visit. And if he, like most of the young travelers, belonged to the group of men which wanted later to be appointed to the civil or diplomatic service, he studied especially those aspects of the nation's history which had the closest relationship to his future activities and responsibilities, diplomatic and governmental. This specific interest of the culturally leading groups of earlier societies is one of the reasons that the study and teaching of history was for so long a time one-sidedly dominated by experts in the history of diplomatic affairs.

Now, if we continue our comparison of the training of the modern teacher with the training in certain professions of earlier periods, it is very natural not only to instruct the young teacher along horizontal lines, on the level of our present situations and conditions, but to add the vertical to the horizontal and to introduce him into the history and the growth of the educational system and thought in different countries. Only in this way can the student of education acquire the knowledge necessary for the general understanding of his profession; he must learn not only that certain institutions of this or that character exist in this or that country, but he must learn why they exist and why in the frame of a given environment and under the lode star of certain ideals a nation develops its specific pattern for training the young. No man is able to acquire a fundamental insight into the significance and limitations of his vocation who sees it only from immediate contact. He will easily be caught in the snares of the daily routine, he is always in danger that his work will either bore him if he follows it too long, or that he will lose his sense of

proportion and consider himself and his job as the center of the world, or, as the old Homer would say, as the place ὅθι τ' ὀμφαλός ἐστι θαλάσσης, where is located the navel of the world. The danger of losing a proper notion of the adequate proportion of one's own rôle in the co-operative business of mankind is especially imminent in the teaching profession. Members of the younger generation, whether they like it or not, are by laws of the state and by the will of the parents compelled to listen to their teachers and are not usually sufficiently equipped to contradict the sublime wisdom showering copiously from the platform of the classroom. Furthermore, members of the teaching profession, especially in institutions of higher learning, are allowed to cultivate their interests and to do more or less productive research work in narrow fields. This dedication of a man's whole life to a small subject can be one of the most productive of all tasks, and I am the last one who would not respect the activities of a research worker who sacrifices his person for the solution of a problem which may be ridiculously small in the eyes of a layman, but which may help to bring about a new discovery or invention for the benefit of mankind. But, nevertheless, there are ways for teachers and scholars to keep their minds open. One is to take an interest in the frictions and duties of public life, because if a man remains aloof, he misses an extremely educative experience. But if his interest is to be intelligent, he ought to avail himself of the inspiration and of the broadening influence of historical perspective. Sometimes when a neighbor asks me, "Why history?" I am tempted to answer, "Because we ought to be too selfish to be completely satisfied with spiritual intercourse among ourselves, and because we ought to be too modest to think that we can do our best without the support of the great men who have given their thought and their lives to our profession."

Very often the neglect of history is the result of the rather superficial assumption that history is worthless, because it is past; an opinion which more or less consciously involves the conviction that in the natural change of things mere chrono-

logical sequence is identical with progress and improvement. This idea may be natural enough to men who in the course of their lives have been fortunate enough to observe a continuous and uninterrupted advancement from the worse to the better. Happy the nation which, like the United States, can look back to a relatively steady and continuous growth. But even here the last decades have offered enough untoward instances to correct too lofty an optimism. For such an assertion we may take the example from our present environment. We are celebrating the tercentenary session of Harvard University, we may also celebrate the memory of a great educator who a century ago helped to pave the way for a free, unsectarian, national American education, Horace Mann. I think there are many reasons why our present and our coming generation of educators should not be content to rest happily on the results of this great man's labor and sacrifices and his conflicts with political and dogmatic reaction; on the contrary, we have many reasons to become immersed in his life in order to revive his spirit in ourselves.

The former professor of philosophy at Harvard University, George Santayana, wrote a very noteworthy sentence, which says: "Those who cannot remember the past are condemned to repeat it."

ROBERT ULICH,
Harvard University

The Fifth International Conference on Public Instruction

THE Fifth International Conference on Public Instruction was held in Geneva, Switzerland, July 13 to 17.

The program consisted of the presentation by the delegates from the countries represented, of reports concerning recent changes in the field of public education, and the discussion of recent publications of the International Bureau of Education on the construction of schools, on the organization and management of rural schools, and on the organization and management of special schools.

The following countries were represented by official delegates: Albania, Afghanistan, Germany, Argentina, Belgium, Bulgaria, Chile, Colombia, Denmark, Danzig, Egypt, Ecuador, Spain, United States, Estonia, France, Greece, Guatemala, Hungary, India, Iran, Ireland, Italy, Japan, Latvia, Lithuania, Nicaragua, Norway, Netherlands, Poland, Dominican Republic, Sweden, Switzerland, Czechoslovakia, Union of South Africa, Uruguay, Yugoslavia, and Finland. The total number of delegates was fifty. All of the United States delegates were present, as follows: Dr. Clarence S. Marsh, associate director of the American Council on Education; Dr. Fannie Fern Andrews, member of the Committee on International Aspects of Education of the American Council on Education; Dr. William Howes Collins, chairman of the Alumni Advisory Council of the National Student Federation of America, member of the Student Advisory Board of the National Institute of Public Affairs and of the Geneva School of International Studies, and Dr. James Frederick Rogers, United States Office of Education, who was chairman of the United States delegation.

The conference was organized by the International Bureau of Education. A. N. Caballero, Minister of Education of Colombia was elected president. Official business was conducted by the Council of the International Bureau. The following resolutions were presented to the Council:

THE ORGANIZATION OF SPECIAL SCHOOLS

Bearing in mind, that according to recent statistics, although the percentage of deaf-mutes and particularly of blind people is diminishing in a marked degree, the number of mentally defective—backward or mentally unstable—tends on the contrary to increase in alarming proportions;

That it behooves public authorities to take useful measures to remedy the causes of this increase (hereditary diseases, alcoholism, conditions of modern life);

But is the duty of educationists to concern themselves with the conditions by which the physically defectives, blind and deaf-mutes, on the one hand, and the mentally defective on the other hand, may be, by an appropriate education, enabled to live an economic and social life more useful to themselves and to society—and trained like other children to profit by the moral, artistic and intellectual riches which truly benefit human life;

Bearing in mind on the other hand, that in the sorting out of mentally defective, extreme caution must be taken, so as to avoid classifying prematurely as sub-normal children who may be able to live an almost normal life, thus lowering for the whole of their life their prestige in their own eyes and in the eyes of society;

Recommendations to the Ministries of Public Instruction in the various countries:

1. That the creation of special classes or schools and, if need be, of boarding schools, for the physically defective, on the one hand, and for the mentally defective, on the other hand, shall be compulsory for all authorities concerned with the organization of schools;

That these establishments shall be created under such conditions that the special instruction shall not be available only to urban centers;

2. That the instruction given in them shall be under the same conditions of gratuity as the instruction given in the ordinary classes of normal children;

3. That, for boarders, scholarships shall be awarded liberally to the children of poor families;

4. That the education shall include not only

(a) special culture (for example learning to speak and lip reading for deaf-mutes, reading and writing in

Braille, etc., for the blind) of which these children have need;

(b) general culture, which ought to be, as far as possible, comparable with that given to other children; but also an appropriate vocational training, taking into account the state of the labor market;

5. That the fullest account should be taken of the children's possibilities; that in consequence classes should be very small, and methods of instruction should always be the individual, concrete, and active methods, already in use in a certain number of countries;

6. That the children should be considered not as being publicly assisted, but as educable; that, in consequence, the establishments devoted to them should belong to the ministries intrusted in the various nations with public instruction;

7. That the selection of sub-normal children should be carried out through a close collaboration between teachers and doctor-psychiatrists—and that it should be effected with extreme caution;

8. That initiation into the special teaching required should, if possible, be given to future teachers in normal schools or training colleges; that probationary periods should be instituted for those who wish ultimately to teach in special schools; that access to these probationary periods should be facilitated by the granting of sufficient scholarships, or by the continuance of the payment of salary;

9. That a supplementary salary should be granted to teachers who, holding a certificate of aptitude for the teaching of abnormal children, effectively teach in special schools.

LEGISLATION REGULATING SCHOOL BUILDINGS

Considering that the modern school should give the child a really living education, making a large appeal not only to book learning but also to the child's observation of his environment and to his various natural activities; that it should utilize in a large measure the new means of information placed at its disposal by modern science (gramophone, wireless, lantern slides and films, etc.);

That, in addition, it can no longer be limited to the acquisition of the "tools of the intellect" (reading, writing, arithmetic, drawing)—and the essential knowledge that no modern man can be without—that it should also insure to all the children committed to its charge as complete as possible a physical, intellectual, moral and social development;

That consequently it ought to guarantee to these children healthy conditions of school life, to supervise their physical development, providing such supplementary food as may be necessary, at the same time teaching them to acquire sound health habits;

That manual activities should be given their rightful place in the school so as to insure a harmonious development of both intellectual and physical faculties, and to provide a comprehensive vocational orientation for the older children about to leave school;

That the moral and aesthetic education of children should include the organization of school societies and gatherings of which the school itself should always be the center, and that the children should continue to participate in these, even after they have left school;

That in many countries the erection of new school buildings would help in the fight against unemployment and the financial distress.

Recommendations to the Ministries of Public Instruction in the various countries:

1. That, in designing school buildings, while structural and hygienic needs should be given due importance, the interests of education should be the first consideration, and that the opinion of school authorities and teachers should carry great weight;

2. That the elementary schools should be built, as far as possible, not in the heart of the towns but on sites where large playgrounds are possible as well as spacious premises and where playing fields can be properly laid out;

3. That the planning of school buildings (orientation and size of classrooms, means of access, ventilation, lighting, heating), should be influenced by local conditions and by the desirability of harmonizing the school with its surroundings, but above all by hygienic considerations;

4. That the size of the classrooms, the type and arrangement of the furniture and equipment should be determined in consideration of the peculiar needs of the "activity" school;

5. That provision should be made for libraries and for the use of the gramophone, school wireless, lantern slides or films, etc.;

6. That schools should be provided with school gardens, demonstration plots, and space for open-air classes;

7. That they should also possess separate art rooms and workshops, and, for girls, rooms for domestic subjects (in particular needlework, cooking and laundry);

8. That, to promote the physical development of the children under suitable conditions, the schools should be provided in all cases with refreshment rooms or school canteens, school clinics with the necessary equipment and materials, playing fields, gymnasia and also wash basins, bathrooms, and showers;

9. That the premises should be equipped for school and post-school activities (reading rooms, halls for lantern shows, assembly halls), the poorer schools being allowed the possibility of utilizing one room for the several activities;

10. That, as far as possible, these *desiderata* should apply not only to urban schools, but also to rural schools, the state, if necessary, aiding local authorities in rural areas;

11. That programs for new school buildings should form part of the public works undertaking to combat the economic crisis.

THE ORGANIZATION OF RURAL EDUCATION

Considering that in various countries the peasant class constitutes a reservoir of physical health and an element of moral force which it is necessary to safeguard in integrity by fighting against the drift to the towns and the depopulation of the country;

That the conditions of modern civilization and of agriculture make it possible to organize an easier and a more comfortable life in the country;

That, if the development of instruction has not contributed as much as some would lead us to believe to keeping young people in the country, this grievance could in some cases be attributed to the schools;

That, on the contrary, the rural school, without aiming at giving a truly agricultural teaching, can and ought to enable country children to understand the importance and the social and intellectual dignity of peasant life, and to give them the scientific knowledge which is required today as the basis of an intelligent development of rural vocations;

Considering that, on the whole, and for varying reasons, the problem of the rural school is to be found in almost all countries today.

Recommendations to the Ministries of Public Instruction in the various countries:

1. That in principle the education given to the children in rural schools should not be in any way inferior to that given to the children in urban schools, and that it should permit them to pass into secondary schools;

2. That, in practice, and to assure greater justice in the field of education, an effort should be made to remedy as far as possible the unfavorable conditions existing in rural schools;

3. That the same level of instruction should be assured in the country and in the towns, the teachers naturally having the right to adapt the curricula to local conditions and, in particular, to draw their "centers of interest" from the environment in which their pupils live;

4. That an effort should be made to adapt the organization of rural schools (holidays, vacations, time-tables, as well as curricula) taking account of the conditions of local or regional life;

5. That, in order to assure a more complete community spirit between urban and rural schools, both should always be under the same ministry;

6. That, in the general programs, an adequate place should be given to the rudiments of rural life;

7. That rural teachers should utilize the peculiar didactic facilities which their environment offers them to give a concrete and living character to their teaching;

8. That, in the upper classes of the rural schools, the scientific instruction, while refraining from being truly agricultural, should deal particularly with the rudiments which agriculturists ought to have today in order to carry out fruitfully and intelligently their profession;

9. That, in order to enable rural schools to give the children the full education to which they have the right, the maximum number of pupils to be admitted to the one-teacher schools should be strictly limited;

10. That an endeavor should be made to reduce as far as possible the number of one-teacher schools by the provision of central or consolidated schools; that, even if one-teacher schools are reserved for the younger pupils, central classes should, where possible, be established for the older boys and girls; that the necessary transport and canteen services should be organized for this purpose;

11. That, for young people of rural families, who wish to continue their studies and who do not desire a truly agricultural training, sections in which particular importance is given to ideas preparatory to rural life, should be established

in the senior or higher elementary schools, in addition to the general sections preparing for the higher elementary school certificates;

12. That teachers of rural schools should not be inferior in relation to those in town schools;

That, with this end in view, a general and professional training of the same level should be given to both, either in common or in special establishments for urban and rural teachers,—an adequate place being given in either case to rural elements, and in the case of women teachers to domestic elements;

13. That courses in agricultural or domestic instruction should be instituted for men and women teachers wishing to specialize in post-school or continuation work in rural areas;

14. That, in order to assure to a certain degree the stability of the rural teachers by compensating them for the inconveniences and the disadvantages of living away from the towns, special benefits should be granted to them;

15. That the work of the rural school properly so called should be supplemented or facilitated by extracurricular or post-school activities such as young farmers' clubs, itinerant libraries, rural wireless or educational cinematograph sessions, educational and cultural missions, correspondence courses, etc.

The report of the proceedings of the Conference will be published by the International Bureau of Education.

The Conference manifested great interest in the report, "Changes in the Field of the Educational Movement in the United States in 1935-36," presented by the chairman of the United States delegation. Questions were asked concerning the educational program in the C.C.C. camps, the methods of preparing educational films, the progress of the youth hostel movement in the United States, and the development of the educational guidance programs. The delegate from Bulgaria explained that Bulgaria was the first country to develop work camps for students, and the delegate from Germany spoke of the German Labor Service camps as a means of character training.

Other reports revealed that Denmark is making reforms in the middle and secondary schools with more emphasis than formerly on the modern teaching of geography, civics, and bi-

ology; that Egypt is creating a "national style of architecture" in its schools, and is allowing a half day, once a week, for "free work," and that France has raised the school-leaving age to fourteen.

The United States delegates recommended that the United States should participate in similar international conferences on public instruction, should they be held.

JAMES FREDERICK ROGERS,
Chairman of the United States Delegation

The Literature of Education

FORTY years ago Will S. Monroe published under the title, *Bibliography of Education,* the product of several years of effort in compiling a comprehensive list of books and pamphlets in the field of education. This compilation, which may be accepted as representing the worth while educational literature of the last decade of the nineteenth century, includes 3,200 titles, all in English except in the case of general reference works. Under the head of "Current American Educational Journals," the following titles are given: *Primary Teacher, Education, Educational Review, Intelligence, Journal of Education, Pedagogical Seminary, School Bulletin, School Journal, School Review, Popular Educator, Primary Education, Public School Journal,* and *Teachers Institute.* In his study, *Educational Periodicals during the Nineteenth Century,* S. E. Davis lists about fifty additional journals as being published in 1897. Most of these, however, had only a local circulation and were relatively unimportant. Hence, the list given by Will S. Monroe may be accepted as a measure of the worth while periodical literature of the period.

The scope of the educational literature of forty years ago is indicated by the following captions which were employed in classifying the 3,200 titles:

1. Works of reference
2. History of education
3. Theory of education
4. Principles and practice of teaching
5. Methods of instruction
6. School administration
7. Kindergarten
8. Education of colored children
9. Education of defective children
10. Professional education
11. Manual training
12. Philosophy
13. Psychology
14. Moral education

15. Physical education and school hygiene
16. Education of women
17. Self-culture and home education
18. Sociological aspects of education
19. School systems
20. Educational conferences and exhibits
21. American reports.

These rubrics together with the subdivisions show that in 1897 education was an extensive field of study.

We do not have a similar bibliography of education for 1936, but certain information can be cited upon which an estimate of the production of the books and pamphlets during the past forty years can be based. From 1898 to 1907, J. I. Wyer published an annual "Bibliography of Education" in the *Educational Review*. Three later compilations were published as bulletins of the United States Bureau of Education. The numbers of books and pamphlets in English in these annual lists are as follows:

1899	—	118
1900	—	117
1901	—	98
1902	—	90
1903	—	144
1904	—	177
1905	—	177
1906	—	135
1907	—	183
1908-09	—	455
1909-10	—	564

These figures show that during the years immediately following the publication of the *Bibliography of Education* our educational literature was being added to at the rate of over one hundred volumes per year and that the rate had increased to over two hundred volumes per year by 1910.

Beginning in 1926, an annual list of books and pamphlets has been published in *School and Society*. The annual number of volumes has been as follows:

1926 — 221
1927 — 431
1928 — 434
1929 — 660
1930 — 677
1931 — 772
1932 — 842
1933 — 804
1934 — 763
1935 — 816

The increase from 221 volumes in 1926 to 842 volumes in 1932 is probably due in part to more effective means for seeking out institutional publications and books and pamphlets published privately or by companies not widely known. If the procedures employed during recent years had been followed from the beginning, the figures for the earlier years would have been materially larger. During the last four years the annual production has tended to become stabilized at about 800 volumes, which is one-fourth of the number of titles in the *Bibliography of Education* published in 1897.

One can only speculate in regard to the number of titles in a comparable list today, but, in view of the records of publications since 1897, it seems reasonable to estimate that a *Bibliography of Education* in 1936 would include more than 10,000 titles. Possibly the number of volumes would be materially larger. This estimate does not include textbooks, except in the field of education, or writings related to educational topics but not considered as belonging in this field. School reports, courses of study and other documentary materials are also not included.

Our periodical literature has increased enormously since 1897. The *Education Index* indexes 146 periodicals and the *Classified List of Educational Periodicals* for 1935 prepared by the Educational Press Association of America includes 431 titles. The list given in the *Education Index* is roughly comparable to the thirteen periodicals named by Will S. Monroe, and it is probably conservative to say that the annual production of periodical literature in the field of education is now ten

times that of 1897. The three-year accumulation of the *Education Index,* 1932-35, includes approximately 20,000 titles. Although this number includes books and pamphlets as well as articles, the number of articles relating to education in periodicals not indexed is probably equal to the number of books and pamphlets. Hence, the annual production of periodical literature in the field of education may be estimated at not less than 7,000 articles.

The present scope of our educational literature is indicated by the captions employed in classifying the 1935 list of books and pamphlets in *School and Society,* March 28, 1936.

1. History, Principles, and Philosophy of Education
2. Administration and Finance
3. Supervision
4. Reports, Surveys, Statistics, and Legislation
5. Conduct and Character Formation
6. Psychology of Childhood and Youth
7. Educational Psychology
8. Educational Tests and Measurements
9. Special Education and Exceptional Children
10. Educational Research
11. Teachers and Teaching Methods
12. Pre-school, Kindergarten, and Elementary Schools
13. Curriculum
14. Secondary Education
15. School Libraries
16. Reading, Writing, and Languages
17. Mathematics and Science
18. Geography and Social Studies
19. Art, Music, and Drama
20. Vocational, Business, and Industrial Education
21. Guidance and Personnel Service
22. Health, Physical Education, and Mental Hygiene
23. Extracurricular Activities
24. Rural Education
25. Higher Education
26. Adult Education
27. Visual and Radio Education
28. Education for the New Social Order

Most of these captions or equivalent phrases appear in the

list employed by Will S. Monroe in 1897 or as subdivisions in the table of contents, but it is evident that the field of education has expanded during the past forty years. Curriculum, educational tests and measurements, educational research, extracurricular activities, guidance and personnel service, home economics, school libraries, rural education, adult education, visual and radio education, and education for the new social order do not appear even as subdivisions in the earlier list. These new captions are indicative of the expansion of the field of education, but probably a more significant phase of the development has been the growth within such fields as school administration which existed in rudimentary form in 1897.

Will S. Monroe began the preface of his *Bibliography of Education* with the sentence, "The literature of education is now admittedly large and is growing daily." A similar statement had been made by G. Stanley Hall in the preface to his *Bibliography of Education* published in 1886. After referring to the field of "strictly pedagogic literature," Hall points out that the material is "far too great to be mastered in a lifetime of the most diligent reading." He also observes that the task of readers is made more difficult by the necessity of cultivating the "robust moral power of ignoring the great mass of petty undervitalized and worthless reading matter that is printed for them."

If these statements are accepted as descriptive of the situation during the period before 1900, stronger language is needed to describe the present situation. In addition to the enormous increase in volume, there has been a significant change in the character of our educational literature, especially that appearing in periodicals and other serial publications. Although the phrase "science of education" was employed by several writers before 1900, relatively few research studies were reported before 1910. *The Futility of the Spelling Grind* by Rice was published in 1897; *The Grading of Students* by Meyer in 1908; *Arithmetic Abilities and Some Factors Determining Them* by Stone in 1908; *Lag-*

gards in Our Schools by Ayers in 1909; *Handwriting* by Thorndike in 1910. These studies represent pioneer efforts to apply scientific methods to the study of educational problems. *The Bibliography of Research Studies in Education* for 1933-34 lists 3,500 studies reported from 117 institutions. If the studies produced by state departments, educational associations and school systems, and other agencies were added, the total would doubtless be in excess of five thousand.

Thousands of "contributions" produced by research workers are scattered through the volumes of our vast periodical literature. Others have been published as monographs or bulletins. Still others are recorded only in unpublished manuscripts. Many of these contributions deal with trivialities or attempts to prove the obvious. Others report conclusions that are not justified by the data. Except for fragmentary summaries, the reported contributions remain food for thought. They have not been evaluated, synthesized, nor interpreted. A person who attempts to become acquainted with our research literature soon finds himself mired in a morass of reports. Many of them are inadequately reported or expressed in a dialect of technical terminology and symbolism which makes comprehension difficult except for the highly trained reader. Frequently the reader accepts uncritically the stated conclusions and by so doing contributes to the perpetuation of error.

The non-research literature is scarcely less formidable. Dissatisfaction with texts available for a course as conceived in a particular teacher training institution has frequently motivated the instructor to prepare a new text which in many cases has been mainly an organization of ideas from existing texts expressed in the instructor's pedagogical vocabulary. New methods and plans have stimulated expository writings and discussions which in many cases merit the designation of "petty undervitalized and worthless reading matter." The total result is that the student soon is hopelessly lost in a tropical jungle of pedagogical jargon and, if he succeeds in comprehending this, he is likely to be so confused

by the varying points of view that he begins to wonder if the authors really understand what they are writing about.

The writings of the field of education may be classified as: I. General reference works (dictionaries and encyclopedias, annual publications such as the yearbooks of the International Institute of Teachers College, general bibliographies and indexes); II. Books, monographs and pamphlets; III. Serials (periodicals, bulletins, circulars, and the like, except such annual publications as are included in I); IV. Documents (reports, courses of study, and the like); V. Unpublished materials (theses and other manuscripts).

General reference works form an important division of the literature of a field, especially when the field is voluminous and extends over a wide range of topics. Dictionaries contribute to the development of a systematic and precise vocabulary which is a prerequisite for clear thinking. Critical study of the writings of educational philosophers, even those of high distinction, frequently results in confusion because the meanings of the terms used are not clear. Sometimes the reader suspects that the writer has failed to think clearly. An encyclopedia provides an alphabetical arrangement of syntheses of material from the other divisions of the literature. Such reference works serve as handbooks for administrators and teachers. They are important if not essential tools in the instruction of students. Instructors can refer them to an encyclopedia for a summary of the thinking and research relative to a topic. Bibliographies and indexes are essential for the economic use of books and periodical literature. If there are not adequate reference works, the literature of a field is not well balanced and such a condition reflects a limitation in the scholarship of the producers of the field.

In 1897 Will S. Monroe listed eight works by American and English authors as encyclopedias. Although only two are encyclopedias in the strict sense of the term, the list is evidence that educators of the period prior to 1897, when the amount of literature in the field was much less than our present

accumulation, attempted to meet the need for this type of reference work. Fifteen general bibliographies are also listed.

From 1898 to 1906, J. I. Wyer published in the October number of the *School Review* the compilation of the bibliographies of the preceding calendar year. He also compiled an annual bibliography of education from 1898-1907 which appeared in the *Educational Review.*[1] In these annual bibliographies he cataloged not only books but also important articles in periodicals. L. N. Wilson's *Annual Bibliographies on Child Study* (1897-1911) are comprehensive in this field. In 1903 Locke published a classified index of the *School Review* which was given the title *A Bibliography of Secondary Education.* Cubberley's *Syllabus of Lectures on the History of Education with Annotated Bibliographies* appeared in the following year. Activities along these lines culminated in 1911-13 in the publication of the *Cyclopedia of Education* by Paul Monroe.

The facts just cited justify the statement that up to about 1915 the literature of the field of education was well balanced. It is true that no dictionary of terms had appeared and that an encyclopedia was needed before the publication of Paul Monroe's *Cyclopedia of Education.* But considering the amount of literature in the field, one finds the needs of practitioners and students for general reference works were at least reasonably well provided for.

From 1913-21 educational writings were chronicled in the *Monthly Record of Educational Publications* issued by the United States Bureau of Education. Beginning in 1922, current publications were recorded in a modified form in bulletins of the United States Bureau of Education, and since 1931 this activity has been assumed by the Department of Education of the University of Chicago, which publishes lists of selected references in the *Elementary School Journal* and the *School Review.* The *Education Index,* which began in 1929, furnishes a comprehensive catalog of publications relating to educational

[1] Later, compilations of both kinds were published by United States Bureau of Education.

topics. The annual *Bibliography of Research Studies in Education,* by the United States Office of Education, lists many unpublished theses. For the period 1917-27 the titles of masters' and doctors' theses in education are available in compilations by Walter S. Monroe. The *Review of Educational Research* initiated in 1931 "summarizes," in three-year cycles, the research in the various divisions of the field of education. In addition, there are a large number of bibliographies and summaries on restricted topics.

The *Education Index,* the *Review of Educational Research* and the other lists afford helpful catalogs of educational writings, and their usefulness will be increased by the compilation of bibliographies and summaries by Walter S. Monroe and Louis Shores which is now in press. This volume lists over four thousand titles. *How to Locate Educational Information and Data,* by Carter Alexander, also will contribute to more effective use of libraries. But no dictionary or encyclopedia has been produced, and hence our educational literature today cannot be considered well balanced.

In a review of Paul Monroe's *Cyclopedia of Education* in the *Educational Review* (Volume 42, page 421), E. A. Fitzpatrick observes that "Ten years is a very long time when chronicling the progress of the comparatively new science of education." Later he says (page 423), "As education rears itself in the group of sciences, it becomes more and more difficult for even an expert in some of its phases to feel certain about many topics connected with the science of education, which his training has not fitted him to comprehend. To such experts this cyclopedia offers relief from anxious moments and wasted energies." If ten years was a "very long time" in the development of the science of education in 1911, the twenty-five years since that date, if measured in terms of the production of "research studies," is a very much longer period than is indicated by the lapse of time.

In the *Education Index* for September, 1935, a paragraph appears under the caption, "An Educational Need." After referring to the need for a dictionary of terms, the writer says,

"There is, however, another place on the shelves of our reference collections that needs to be filled. A modern, authoritative encyclopedia of education is the obvious answer. Monroe's is the only one of its kind, and since the date of the last volume so many changes have taken place that the research worker often fails to find what he wants in its otherwise admirable pages. A thorough revision, or as that is possibly a thankless task, a new encyclopedia would surely find a ready sale. Where are the enterprising scholars to undertake the work?"

The literature of a field is an index of the scholarship of the productive workers. In education the volume of literature has been large, especially during the past ten years, but the need for a dictionary of terms and an encyclopedia has not been met. This reflection upon the scholarship of American educators is emphasized when we note that in the Sixth Edition, 1936, of the *Guide to Reference Books,* Mudge lists one British publication (1921-22) and eight works in foreign languages, five of which have been published within the past ten years, and no American general reference work in the field of education since Paul Monroe's *Cyclopedia of Education* (1911-13). The significance of our failure to produce a dictionary of terms or an encyclopedia in the field of education is magnified when we examine Mudge's compilation for other fields. For example, in chemistry, Mudge lists ten reference works of the encyclopedia type in English published since 1919 and only three in foreign languages. Other fields, including law and medicine, exhibit a similar status.

An encyclopedia is essential in the development of a science of education. If the work done is not evaluated, synthesized, and interpreted at intervals, the efforts of investigators will lack co-ordination and the accumulation of findings will tend to be fragmentary. Much of it will be lost to the students in our teacher training institutions and the efforts of research workers will not be highly efficient. The investment of time and money represented by our annual production of several thousands of "research studies" would contribute much more to a

science of education if research workers were provided with a comprehensive evaluation, synthesis, and interpretation of what has been done. Until we have a general reference work that does this, our progress toward a science of education will be slow and inefficient. Furthermore, the application of the results of research in educational practice will be limited until it is possible for students and practitioners to become acquainted with what research has accomplished in the field of education.

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Dual-Professorships

A DUAL-PROFESSORSHIP, representing at the same time both academic and professional interests, in the setting of an *all-university* School of Education may prove to be the key to a solution of the conflict regarding teacher training which has long persisted between colleges of liberal arts and education.

Those who conceive this disagreement to be merely a question of who will teach methods courses seriously over-simplify the problem. In some universities, methods are taught by education professors; in others, by academic instructors. Neither scheme seems to have proved satisfactory; neither plan has solved a half dozen even more important issues. Among the latter problems of university organization for effective teacher education are: (*a*) the selection from among existing academic courses, those which satisfy prospective teachers' needs, rather than departmental ambitions; (*b*) the continuous revision of academic course content and introduction into the arts and science departments of the necessary and appropriate new courses; (*c*) the inculcation in students of high ideals of education as a profession, and (*d*) the recruitment for educational service of the strongest, rather than the weakest students.

A dual-professorship conceived merely as a position of simultaneous membership in two rival colleges would contribute little to the solution of these basic problems. But a dual-professorship can become significant, when established in a school which is all-university in character. It is in the latter setting that the position can assume a place of leadership in the solution of teacher training difficulties which have long beset university administration.

The all-institutional school established in 1934 at Syracuse University seems to have provided an organization which places the dual-professor in a position of inescapable responsibility, and into a situation where his efforts tend to be effica-

cious. The fundamental changes in the reorganization at that institution involved the substitution of an all university school for the ordinary co-ordinate College of Education; it provided for dual enrollment of students and an all-university faculty of forty-three members, including professors of education, departmental representatives from eight different colleges on temporary appointment, and eleven dual-professors.

Sophomores of eight campus colleges are admitted into this all-university school by a stringent selective system.[1] Having studied recommended courses in the lower division, students follow curricula in the upper division prescribed by the professional school. Juniors and seniors may continue a dual enrollment in their related colleges for purposes of enumeration and general student personnel services, but there are no parallel upper division curricula leading to teaching. Entrance to the profession can be attained only through selection by the professional school and through completion of its curricula. The only avenue to the education profession at Syracuse is the one all-university school.

On graduation, students are recommended for the Bachelor of Science degree by the professional school alone or for the "dual diploma and appropriate degree" jointly by the School and the College of Home Economics, Business Administration, Liberal Arts, Speech, Library Science, or Fine Arts. At commencement all students of education are presented as a single professional group in the manner traditionally followed for law and medicine.

The character and duties of the faculty, including the eleven dual-professors, were prescribed by the University trustees as follows:

> Representatives of the various colleges shall be appointed annually on nomination by the Chancellor of those jointly recommended to him by the Dean of Education and the Dean of the College represented. The appointees will continue to

[1] Harry S. Ganders, "The Selection of Prospective Teachers in the Sophomore Year of the University," *Proceedings of the American Educational Research Association*, February, 1936, pp. 49-57.

hold membership in the faculties of their respective colleges, thus holding dual membership in two faculties during the period of appointment. Selection will naturally be from those most interested and active in teacher training and related school problems. It is the responsibility of this faculty to advise with, dually register, and direct study programs of individual students enrolled in the School of Education; to supervise practice teaching in the public schools; and with and through the Dean of Education, on joint responsibility, recommend to the state for teaching certificates.

Dual-professors are given permanent appointments on the staff and are assigned titles such as *Instructor in Social Studies and Education.* They teach methods and curriculum courses in the areas which they represent, and supervise the practice teaching of their majors. Most are competent to complete their teaching schedule in either academic or education courses; some teach in both. There are advantages which accrue from having dual professors complete the teaching schedule in their academic department. They should maintain their offices and retain full status of membership in their respective departments. The latter is absolutely essential. Writing, research, and addresses are expected pertaining to the teaching of the subject or area represented. The professorships are nominated for appointment by the Dean of Education, but must be approved, from the point of view of competence in the academic field, by the related deans. A nominee should not be a head of one of the University's departments. There are many advantages in making an entirely new appointment, from outside the University.

Dual-professors selected because of their *primary* interest in education and their experience in public schools, coupled with high qualifications[2] in academic departments, have been eminently successful in securing departmental offerings adapted to professional preparation. The teaching-major in English has been almost entirely reconstructed. It now includes needed new courses in English and in library science. A new teaching-

[2] The ideal is the equivalent of a doctorate in both the academic area and in education.

major in social studies includes, in proper proportion, courses in history, sociology, economics, geography, and political science. This was effected by the dual-professor working with the five departments independently and as a single group. This dual-professor in social studies and education represents the five departments on the Committee of the School of Education which selects sophomores from among candidates for this major. He it is who registers and advises students. Such developments in social studies, English, mathematics, and other fields have commended themselves to other departments. The physical and biological science departments, with the advice and counsel of a public school supervisor of science functioning in the capacity of a dual-professor, have united in the recommendation of a general science teaching-major. Here, as in the Social Studies Program, courses are included from the five major departments concerned. Two new courses, "Educational Biology" and "General Science," are being offered.

Dual-professors representing the special areas of music, art, commercial education, library science, speech, physical education, and home economics become adjusted quickly and easily in an all-university school which, like their own related colleges, is dominated by a vocational objective. Their own departments readily provide needed departmental offerings and the dual-professor's own concept of an acceptable program is broadened through the influence of the all-university school with its broader and more liberal outlook.

In conclusion: (*a*) the dual-professor is selected because of his *primary* interest in teacher preparation, because of his training in both academic and the professional fields, and because of his public school experience; (*b*) he is appointed on nomination of the Dean of Education, with the concurrence of the dean of the related college concerned; (*c*) his salary is budgeted on an all-university schedule; (*d*) his title is *Professor of —— and Education;* and (*e*) his teaching schedule includes methods, and other courses in education, or academic courses in his field, or both education and academic subjects.

His duties include: (*a*) recommending to departments and the school (1) the elimination of obsolete courses, (2) the revision of existing courses, and (3) the adoption of needed new courses; (*b*) keeping members of both the professional school and his department aware of changing conditions in the schools, and interpreting resulting demands upon the University; (*c*) serving on the admission committee of the school for the selection of the most promising of his sophomore candidates; (*d*) redirecting the interests of rejected applicants; (*e*) registering and advising accepted students; (*f*) directing observation and supervising practice teaching in the public schools; (*g*) teaching methods courses; (*h*) representing the school at teachers' professional meetings; and (*i*) conducting his research and publishing in the field of school curriculum and methods.

Thus the dual-professorship is the key to success of the all-university School of Education. The fact that his highly selected, prospective teachers are permitted, through the device of dual enrollment, to retain a nominal relationship to their related colleges, obviates many obstacles to co-operation. The dual-professors and the profession they represent enjoy an enhanced prestige on the University campus.

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Do Junior College Students Know Where They Are Going?

A STRIKING answer to the question of whether or not junior college students know where they are going is found in a recent study of the records of 6,952 students in California junior colleges. In the autumn of 1929, these students named the higher educational institutions which they were planning to enter upon graduation from junior college. In 1935, after an interval of six years, information regarding these students was collected from the higher educational institutions which they expected to enter.

The study revealed that, of this group of almost seven thousand junior college students, only slightly more than a quarter actually entered the higher educational institution of their choice. Of this latter group, only half succeeded in graduating from the higher institution.

Of the students who in 1929 were junior college freshmen, slightly less than one-quarter entered the institution of their freshman choice, and only one in eight graduated from it. The record of the junior college sophomores, as might be expected, is somewhat better. Over one-third of them entered the institution of their choice and almost a quarter of them graduated from it. In both freshman and sophomore classes, however, the difference between expectation and realization has been distressingly great. A further analysis of the situation indicated by these facts has important curriculum and guidance implications.

In the autumn of 1929, in connection with the California Junior College Mental-Educational Survey, over ten thousand students in the 42 junior colleges of the state were asked whether they intended to continue their education after completing the junior college, and if so to state the name of the institution they expected to enter.[1] Over eight thousand indi-

[1] This investigation was financed in part by a grant from the American Council on Education. See Walter C. Eells, "The California Junior College Mental-Educational Survey," EDUCATIONAL RECORD, XI (October, 1930), 281-91; for a fuller report of the original study see Walter C. Eells, "California Junior College Mental-Educational Survey," California State Department of Education, *Bulletin* No. J-3, Sacramento, California, 1930. 61 pages.

cated that they expected to enter some specific institution. Through the co-operation of the registrars, reports were received from 159 institutions of higher education in all parts of the country. These reports concerned 6,952 students who had expressed the intention of entering the 159 institutions. While the great majority of the students expected to enter one of forty-six California institutions, there were 586 who planned on continuing their education in 113 different institutions outside the state.

A brief summary of the results of this follow-up study is shown in Table I.

Freshmen vs. Sophomores: The question regarding educational intentions was asked at or near the beginning of the college year. It is to be expected, therefore, that the intentions of the freshmen, in college less than a month, would not be so stable nor reliable as those of the sophomores. In general this was the case. The stability of the educational ambitions of the sophomores was slightly more than 50 per cent greater than that of the freshmen (37.6 per cent as compared with 24.6 per cent). There were four institutions, however, in which the advantage was distinctly in favor of the freshmen.

California vs. Non-California: Over 90 per cent of the students indicated their intentions of entering higher educational institutions within the boundaries of the State of California. Their percentage of entrance was almost twice as great as that of the 586 students who expected to enter non-California institutions (25.4 per cent as compared with 14.8 per cent). The holding power of the California institutions was even stronger, relatively, because the percentage that graduated was more than twice as great as for those attending the non-California colleges. It is noteworthy that of 43 students who expected to enter four large eastern and midwestern privately controlled universities—Harvard, Columbia, Chicago, and Northwestern—only one lone individual actually realized this ambition.

Entrance and Graduation: For the entire group of 1,951 entrants considerably less than two-thirds (59.5 per cent) sur-

TABLE I.—*Realization of Educational Ambitions of California Junior College Students*

Group	Number of Institutions	Expected to Enter	Entered	Graduated	Per Cent Entered	Per Cent Graduated
Total						
California	46	6,376	1,852	1,115	29.0	17.5
Other western	26	330	59	24	17.9	7.3
Midwestern	38	117	21	12	17.9	10.3
Eastern	31	100	14	8	14.0	8.0
Southern	18	39	5	1	12.8	2.6
Totals	159	6,962	1,951	1,160	28.0	16.7
Freshmen						
California	...	4,693	1,193	684	25.4	14.6
Other western	...	238	39	13	16.4	5.5
Midwestern	...	77	10	7	13.0	9.1
Eastern	...	69	10	5	14.5	7.2
Southern	...	29	2	0	6.9	0.0
Totals	...	5,106	1,254	709	24.6	13.9
Sophomores						
California	...	1,683	659	431	39.2	25.6
Other western	...	92	20	11	21.7	12.0
Midwestern	...	40	11	5	27.5	12.5
Eastern	...	31	4	3	12.9	9.7
Southern	...	10	3	1	30.0	10.0
Totals	...	1,856	697	451	37.6	24.6
Four Universities						
University of California, Berkeley		1,947	637	418	32.7	21.5
University of California, Los Angeles		1,834	494	301	26.9	16.4
University of Southern California		897	218	75	24.3	8.4
Stanford University		732	214	132	29.2	18.0

vived to graduate from the higher institution. For the freshmen it was even lower, 56.5 per cent; for the sophomores, 64.7 per cent. For the non-California institutions the survival rate was still lower, for less than half (45.5 per cent) of the students actually entering them remained to graduation.

Professional Groups: Are the ambitions and realizations of students definitely headed toward professional schools more stable than those of the entire group? Some light is thrown on this question by the records of the 252 students who planned to enter the six state teachers colleges in California and of the 273 students who expected to enter schools of engineering, aviation, law, medicine, business, and librarianship. The entrance and survival of the group looking forward to teaching careers are very much higher than for the entire group of students studied. Over 40 per cent entered and 27 per cent graduated from the teachers colleges. The reverse is true, however, for the other professional groups. Less than 20 per cent actually entered the professional school of their choice and only 13 per cent of them completed it.

Limitations of the Study: Are the data and generalizations presented above typical? Can they be accepted with confidence as a basis for the determination of policies in 1936, in California or elsewhere? What are the limitations of the study?

The study cannot be taken as a complete investigation of the matter of student survival. How many students changed their minds and entered some other institution than the choice they indicated as junior college students is not known. The registrars could scarcely be asked to check for each institution the entire list of almost seven thousand college students. That the number probably is not great, however, is suggested by the fact that over half (54 per cent) of the entire group of students studied were planning on entering one of the two divisions of the University of California; for most of these it certainly would not have been more convenient or more economical to attend some other institution.

The most serious limitation of the study, probably, is the fact that the question of educational intention was asked in the autumn of the year 1929—the beginning of the current eco-

nomic depression. Many of these thousands of young people doubtless expected to go on with their education after completing the junior colleges in which they were then studying, and their parents fully expected to send them. But many well-made educational plans of 1929 were sadly upset by the autumn of 1930 and 1931 when these junior college students were ready to continue their studies in higher educational institutions. Doubtless the educational mortality from this cause was distinctly greater than in normal times. It is suggested by the fact, pointed out above and indicated in Table I, that such a small proportion of young people from California followed their expectations of going to the more distant and relatively more expensive eastern institutions. There is no information available to show how many of those failing to enter one of the eastern institutions attended a California college or university instead. Even if all had done so, however, it would not have made a great difference in the percentages of the entire group because the non-California "intendants" constituted but 8 per cent of the total number.

Some other indications, not reviewed here, point toward the probability that the greater part of the 72 per cent of these seven thousand young people who did not reach the institution of their 1929 choice during the subsequent six years did not enter any higher educational institution whatever.

The extent to which this condition is due to abnormal economic conditions and the extent to which it may be considered a normal educational situation unfortunately cannot be differentiated. It seems fair to assume, however, that even under the most favorable conditions we may expect a very large proportion of junior college students to fail to enter the institution of their choice for further education. In times of depression, of course, this tendency is accentuated but the depression cannot be credited with all of it, probably not even with a major part of it.

Implications of the Study: The implications of this study, even admitting fully its evident limitations, are important for college administrators and counsellors in both junior and senior colleges. Some of them may be stated briefly.

1. The junior college, far more than commonly supposed, is a terminal institution for a large proportion of the student body—at any rate this has been decidedly true in California during the years of depression.

2. Much more attention should be given to devising, perfecting, and popularizing suitable terminal curricula, both of the semi-professional type and of the civic, cultural, or social intelligence type.

3. In the educational guidance of students such facts as the above should be set before them. They should be shown that there may be some reasonable doubt of their entering the institution of their present choice. Choice of a course of study which will prepare for only a single institution is unfortunate when the chances are three to one against the student entering the institution of his choice.

4. Higher educational institutions should consider the desirability of some relaxation in the rigidity in their entrance requirements for junior college graduates. It is educationally wasteful and socially undesirable to compel students to take prescribed courses of study for transfer if more than two-thirds of them, regardless of their good intentions, fail to enter the institution for which their courses of study prepare them. A better class of students probably could be secured by higher institutions if these higher institutions would place far more emphasis on the *quality* of the work done by the junior college students, rather than on the particular *pattern* of that work.

WALTER CROSBY EELLS,
Stanford University

The Human Side of This Testing Business

The Report of the 1936 College Sophomore Testing Program

"A SOCIAL heritage of wilful immaturity offers perhaps the most terrific resistance to success in college." This statement by an experienced personnel director rings with overtones that come from intimate association with students, from knowledge of them that has been earned laboriously and scientifically.

Activities in the field of personnel have for a number of years commanded the attention of the American Council on Education. The Central Committee on Personnel in 1928 made available its recommendations for the development of achievement tests and of devices and methods of record for identifying personality traits. In recent years the foreign language interests have constructed tests and have carried on extensive research in the content of language courses and in the methods of teaching. Each year L. L. and Thelma Gwinn Thurstone publish in the EDUCATIONAL RECORD an account of the widely used psychological test; and yearly, since 1932, the Committee on Testing has reported on the college sophomore and departmental programs for which the Co-operative Test Service has furnished the examination materials.

Since the interests of the Council in testing and personnel are varied and have become rather specialized, a committee to review the field and to advise on a continued course of action was appointed in the fall of 1935. The present digest brings to a focus these varied activities of the Council.

It was obvious to the Committee on Review of the Testing Movement that technical advances in the field of measurement had far outdistanced the practical applications. Very good measures of achievement in subject matter are available.

Though the repertoire of personality testing leaves much to be desired, there are ready for use commendable instruments in that field, which, in the hands of experts, are valuable for diagnosis and guidance. There appears to be no lack of interest in the giving of the tests; but what to do with the results, once they have been assembled, is shrouded in black mystery for many teachers and school authorities.

As an aid to schools and colleges desiring help in getting the most out of test data, once a program is in effect, a "Digest of Test Uses" has been prepared and is available on request.[1] This digest describes briefly the numerous ways in which colleges are making use of examination materials for research and guidance. It outlines the programs of such typical colleges as Swarthmore, Purdue, Mount Holyoke, Tusculum, Hendrix, Colorado State Teachers College, University of Virginia, and Harvard Graduate School of Education.

The impact on the colleges of testing and guidance is in no sense to be measured by the number of tests used. Of course, tests must be used on a large scale; but the majority of 311 colleges reporting on their most valuable experience with tests cited vocational guidance as first. The main purpose or justification of their testing and guidance programs is to reveal to student and adviser alike the student's educational bank account. Studies may then be chosen to round out experience in terms of the peculiar personal needs and interests of the students, each one of whom will soon step forth into a society marked by uncertainty, turmoil, and the questioning of traditional ideas and institutions.

Having selected their "clients," the colleges meet their obligations to them in part through diagnostic testing. And oftentimes the assumption that the college is always right and that the student must always conform gives way to a more scientific as well as humanitarian point of view. Ideally, standards of success are being regarded as a measure of prog-

[1] Inquiries should be addressed to Ben D. Wood, 500 West 116th Street, New York City, or F. S. Beers, University of Georgia, Athens, Georgia, or Donald J. Shank, 744 Jackson Place, Washington, D. C.

ress, not as something to add to the conceit of the already self-assured nor as a placard to remind the handicapped of their inability to keep up with the gifted.

As part of this philosophy, colleges reporting in the digest cite uses of test results in ways almost too numerous to mention; test data furnish evidence for gauging the amount of class work to be carried, for encouraging superior prospects in undertaking senior college work, for making scholarship recommendations, for determining the amount of work for self-supporting students, and for stimulating both faculty and students. These and other uses indicate that testing and guidance, far from being a mere formality, serve a much felt, practical need.

GUIDANCE IN A PRIVATE COLLEGE

The College of St. Catherine has for many years carried on a systematic program of individual guidance. A small private college for girls, St. Catherine is among the few highly selective institutions. It belongs in the upper brackets by any objective standard that can be applied. For this reason it might be thought that guidance is not needed. Quite the contrary.

Fitting education to the individual and not the conventional reverse procedure is looked upon as a major responsibility of the faculty. True, specialists play their part. The head of the mathematics department does most of the statistical work basic for records, and the psychologists assume responsibility for emotional adjustment. But specialists, teachers, and administrators alike see the problem collectively as well as individually.

Originally, interest in the philosophy and practice of guidance grew out of the fact that some teachers succeeded with certain students while others failed. This "jealousy" led to analyses of causes, and they in turn led to the demand for some means of funding the discoveries not only of teachers, friends, and companions but also of those who had in any major way influenced the student in the past. The means offered by the American Council served the purpose; it was

and has been for seven years the tool needed, sought for, and adopted to "interpret our students to ourselves and to one another." For the benefit of those interested in how the scheme works Sister Jeanne Marie has contributed the following paragraphs:

Under the supervision of psychologists data began to be recorded. Throughout the year, additional facts were entered in the convenient spaces of the personnel folders. Correspondence came to be filed. Results of examinations, exceptionally good papers, original compositions, personality rating sheets, personal requests, comments, etc., were inserted. With the personnel folders filed in steel cases centrally located and kept by a part-time clerk, the reaches of their services have gradually spread until now both students and teacher-counsellors recognize their value. Here but a brief scrutiny may find results from home influences, from high school experiences, from ability and achievement tests, from interest questionnaires, from health examinations, from summer or vocational experiences, from discipline or from change.

Filled out and enriched with significant and accurate observations, the folder offers a cumulative record of progress, as well as a composite picture of the individual student, which instructors may find it advantageous to study before recommending any change in procedure with their students. Let me demonstrate how the personnel folder helps in the guidance of (1) a so-called slow learner, (2) a problem case, and (3) a brilliant student.

At the end of the first six weeks of each year, the cases of all below-average students and failing students are investigated. The health record is first examined. Then percentile ranks are inspected in high school scholarship, in college aptitude, English, and other subjects for which placement tests have been available. Teachers' written explanations of grades are read, personality profiles studied, interests and ambitions canvassed and, in some instances, personal histories are analyzed. Every effort is made to line up assets that will favor improvement.

(1) The slow learner whose personnel folder I have before me reports her health as only fair. Her percentile rank in college aptitude is 1, yet her high school scholarship averages C+. Her highest marks in high school were in

mathematics and in science; her lowest, in English. College aptitude judged solely by single choice vocabulary tests necessarily agrees with low marks in English rather than with the high school average. Certainly the student's speech must be improved. Teachers complain that in all the mechanics of English she makes many errors. Her expressions are those of an illiterate person. What then of her parentage? Her parents are known to be good people who had little schooling, married young, and lived in an isolated community of uneducated folk. Is it not likely that speech faults had resulted far more from habitual use than from lack of ability? If this ability can be rescued, the student will stand a very much better chance in every class.

Back to the personnel folder the guide must go to find what the student has accomplished successfully, what are her interests, her ambitions, how her personality has been rated, whether she has any special talent. High grades in mathematics in high school suggests continuation in that field. Interests in music and in art offer areas of exploration. Desire to travel and liking to be with and to work with others, especially little children, signify a well-socialized attitude. A personality characterized by gentleness, generosity, evenness of disposition, and readiness to co-operate favors preparation for work with people. This student participates in sports and drives a car. She has plenty of money and spends it freely for dinners and shows and records of popular music. She keeps her friends by showering them with gifts. She resents injustice and is quick to perceive it and to compensate for it.

Armed with such information the guide turns now to the occupations in society where the individual's pattern of assets might succeed. Direction of playground activities, supervising arts and crafts in a community center, organizing orchestras for leisure time employment, accounting—these and others are presented to the student. Courses in art, social service, and child welfare come to be her choice. Registration is suited to her plan and with part of a year's additional work beyond the regular college period, she succeeded in obtaining her degree and a teacher's certificate. Of her class she was one of the very first to be placed, and she now writes frequently of taking delight in her supervision of music and art in a school in a mountain town where her education is exceptional and her generosity is appreciated. Her letters are written in acceptable English.

Guidance of a slow learner focused primarily upon assets instead of upon an obvious limitation taught the student how to help herself, kept up her spirit, and was rewarded by the development of a degree of self-dependence not at first thought possible. Not all slow learners are alike, but all of them have some assets; and the more individual their patterns, the more interesting it becomes to work with them, and the surer they may be of a unique place in society later.

(2) Problem cases show such a wide variety when studied with the help of the personnel folder that a teacher-counsellor sometimes wonders what students are not problems. Experience proves, however, that most problems clear up without much difficulty. It is the persistent maladjustment that refuses to yield to improved learning conditions which marks a case as a real problem. Such is that of a young woman who in spite of more than satisfactory grades, charming manners, and demonstrated leadership must be asked not to return to college because the college cannot in justice to the other students keep her among them. The case is not frequent in a college which selects its students carefully and maintains, amidst wholesome and attractive surroundings, a high level of intellectual, social, and spiritual life. Yet it may and does sometimes occur that a young woman of promise may disappoint parents, teachers, friends, and, most of all, herself. The personnel folder of one such student shows high school completed in three years and with honors, a college program of difficult subjects carried with success, but unevenly so. Frequent change of schools, acknowledged craving for excitement, and notation of a worry that has persisted for some years invite analysis of the student's personal history. Two impressions in particular arise from this analysis: *(a)* astonishment at the clearness with which the student traces out cause and effect relationships in her own life, and *(b)* surprise at the frankness with which she pronounces her own condemnation as a spoiled, self-willed child, subject to whims and impulses.

The history is corroborated by testimonials of alternating indulgence and severity exercised by the student's mother whose many telegrams, letters, and visits kept both the daughter and the college in a fret. It is true that now, some years after her required discontinuance at college, the irregularity which finally exposed abuses too flagrantly dangerous to be dealt with in our institution, is seen to be but a continuation of constant irregularities in home life and in early school

life. It is difficult to trace where that life began to go wrong. *A social heritage of wilful immaturity offers perhaps the most terrific resistance to success in college.* And yet, with the facts before me, I understand the student who suffers from so many conflicts. I long to help her gain self-dependence. I want to follow her, encourage her, make her sure that some day her problem will yield. I do not take pride in her expulsion. I regret it and I retain responsibility for continuing guidance as long as we both live.

(3) The problem case interpreted above shows the same percentile rank in college aptitude as the brilliant student whose development I wish next to describe. If all the data gathered for the two cases and recorded in their respective personnel folders might first be reduced to comparable positions on scales of value, and then indicated on as many radii of a circle as were required, one might speculate long and intensely with both causes and outcomes of individual likenesses and differences. The two apperceptographs would overlap at a number of points: college aptitude, as has been mentioned; economic status; number of children in the family; notable accomplishments; summer experiences; and educational plans. They would vary on study conditions and hours of study, mental health, and social adjustments. In some instances, the brilliant student might even appear inferior; she is less popular, is less interested in people, and participates in fewer extracurricular activities. But irregularities among achievements, interests, and ambitions do not appear. On the senior achievement test her total score gave her a rank of 100. Her ambition when she was a freshman was to be a teacher or an author, and the ambition remained the same through college. Her personality rating shows all checks but one to the extreme right. The exception is the trait of getting others to do as she wishes. In this trait she is, however, above average. Upon one occasion she won the acclaim of her whole class by accepting the challenge of a visiting professor from abroad and by upholding the honor of American colleges. The professor had begun to quote Greek prose. Words escaped him. "I do not suppose that anyone here can go on," he said. To everyone's surprise and delight our brilliant student went on for lines and lines and lines. At present the student after a successful year of teaching foreign languages is studying in England for higher degrees. She keeps her friends and is a distinguished leader among our alumnae.

TESTING THE CURRICULUM IN A STATE UNIVERSITY

The University System of Georgia, unlike the College of St. Catherine, is not highly selective. It enrolls about 12,000 students and consists of 16 colleges widely scattered over the state. Although the use of tests for the guidance of individual students has not reached the degree of refinement illustrated at St. Catherine, testing has been extensively used for this purpose.

In Georgia the chief use to which tests have been put is administrative; that is, they have furnished the basis of research in evaluating the survey course program of junior colleges and in laying the groundwork for refining it.[2] Survey courses have been in effect since the fall of 1934, having grown out of an extensive study of higher education in the state. They comprise about two-thirds of the course work and are required in all state-supported colleges except for the technical and agricultural schools. They were formulated on the assumption that the majority of students will not need specialized knowledge, but that they will need and can use a general understanding of the principles and major facts of science, mathematics, history and its allies, and the humanities. Along with knowledge of facts and principles, it was assumed that the content of the courses should be of such a nature that a residual of cultural values might be expected to accrue, a range and variety of enjoyable experiences for their own sake and for the sake of the social plausibility they lend to a personality. Three criteria for evaluating the courses have been employed:

1. Extent of mastery. Has learning been carried far enough to have utility or cultural value?

2. Fitness of the courses as indicated by variability in achievement. Do some students learn very little while others already know what they are supposed to be studying?

3. Fitness of the courses as interpreted against a survey of

[2] Some materials for this section have been drawn from the reports of the Chancellor and of the Examiner to the Board of Regents, Division of Publications, University of Georgia, 1935-36.

what college graduates do. What kind of intellectual equipment has served them best?

Consider each of these criteria separately, first the one on the extent of mastery of the course content. The most illuminating facts come from the freshman-sophomore testing program. Co-operative tests in general science, general mathematics, world history, and English were given to all students entering Georgia state colleges in September, 1935. In May, 1936, the sophomores were given comparable co-operative tests. On the assumption that the students entering college in September, 1934, had on the average the same general ability and training as the students who entered college in September, 1935, it is possible to measure "growth" over the two-year junior college period. Gains were greatest in science and history, least in mathematics and English. This order is roughly in accord with the amount of time devoted to each study. The test on English covered vocabulary, grammar, and sentence structure; on it the achievement of entering freshmen was astonishingly low. For sophomores, while the mean in English approximated the thirtieth percentile, in science it surpassed the national median.

If it is assumed that the work required in science and history is like the work covered by curricula in general throughout the college world, then it appears from the position of the medians on the science and history tests that the Georgia students, or perhaps the middle half of them, have learned enough to be able to compete on fairly equal footing with college students in general. But in mathematics and English their achievement is so low that they are put at a serious disadvantage. What these facts should mean for curricular revision is an open question. At any rate they have a bearing on the problem, especially when the results of applying all four criteria are viewed together.

The variability in achievement of the freshmen and sophomores on the national tests brings up the second criterion of evaluating survey courses. On all of the tests the top 10 to 25 per cent showed marked superiority and the bottom 10 to

25 per cent marked inferiority. But it was thought best to supplement this information through the use of locally constructed examinations. Accordingly sampled groups of students in the physical and in the biological science courses were examined before they had taken the courses and again after the courses had been completed. Gains made were on the average large and significant. But analysis of each student in terms of increase in achievement again verified the findings in the freshman-sophomore tests.

It would appear from the facts that there are two groups of students whose needs are not being met by the survey courses, those who show little or no gain in learning and those who, even though they make signficant gains, know more about the course in question before they study it than 75 per cent of the entire group know after they have completed the course.

These superior students should not be compelled by a required curriculum to spend their time on materials already familiar to them. But what courses should they study? That is a question requiring careful analysis and thinking. Beginning in the fall of 1936 several colleges will, for experimental purposes, exempt a certain number of the superior group, assign them to counsellors and plan a curriculum for them, not on preconceived notions of what they should study but on the basis of a careful, scientific inquiry into their abilities and interests. Tests and interviewing will play a large part in diagnosis and curriculum-making for this group.

The other group of students for whom the survey courses do not seem to be suited are the non-academically minded; those who cannot demonstrate enough learning to justify the assumption that they are profitably investing their energies. How much of temporary or permanent value has a student derived from a study of mathematics, for example, if at the end of a quarter he can answer but ten or a dozen questions on an examination of 150 items? Actually he cannot keep a check book, nor read a balance sheet, nor understand a simple calculation in life insurance or in economic statistics. He is

no more equipped to solve simple mathematical problems than a soldier would be to fight a battle with a popgun in his hands and a potato kettle on his head. Whatever his gains from being in college may be, they are certainly not related to readin', writin', and 'rithmetic.

It is commendable that a number of colleges have recognized the injustice of forcing survey courses or other academic doses down the throats of such indifferent scholars and that they are seriously inquiring into what can be done. The issue is between elimination and a non-academic curriculum.

The third criterion, possibly most alluring but certainly most difficult to apply, is that of relating the achievement of students to the job outlets in the community and finally to the needs of the community whether state, urban, or rural. For example, a city may employ only three engineers, one for public works, and two in a railroad office. This same city may have poorly constructed streets, inadequate sewage disposal, and unsanitary and inefficient public buildings. It may have a paint manufacturing industry fumbling along without a chemist, or a steam power plant stumbling along without a mechanical engineer.

The province of education is not only to train engineers but also to know how many ought to be trained and for what purposes; and to make corresponding attempts to learn community resources for employment and community needs. What proportion of teachers, physicians, economists, and other professional and semi-professionally trained people are actually in service and what proportion would be ideal?

A noteworthy attack on analyzing community opportunities and needs has been undertaken in Milledgeville. The tentative report is some 170 pages long, including exposition, tables, and maps.[8] The marshalled evidence in the report canvasses a vast number of the facts of community life, its economics, its hygiene, its education, its government, its industries and conditions of employment. Although the interpretation of the bearing of all this will require the best that specialists can

[8] W. C. Capel, Georgia State College for Women, Milledgeville, Georgia.

bring to it, particularly in discerning its relation to the junior college curriculum, nevertheless there will be plenty of room for the exercise of the ordinary garden variety of common sense.

To one who scans the report, assuming Milledgeville to be representative, it is clear that only a small percentage of college graduates in Georgia are professional people or specialists in any sense of the word. The greatest majority of them are occupied in the conduct of small business; they are managers of minor enterprises, clerks, technicians, farmers, sales people, housewives, and mothers; they are city officers and members of the state legislature. For these people the highly specialized training that is standard for the professions and allied fields seems clearly not the most desirable, useful, or valuable.

On a common sense basis the Milledgeville report would indicate that the present junior college curriculum of survey courses is, in general, more likely to be understood and used by average college graduates in Georgia than pre-professional and professional curricula. The majority of these graduates, being non-professionally employed, have little use for mathematics beyond simple arithmetic. They make no use of historical detail nor the bibliographical method; they are not chemists, nor biologists, nor classicists. And the smattering of specialized knowledge that they may have gained from their college education has evaporated from exposure to the sun of everyday reality. It is questionable, too, whether the cultural residue that supposedly ornaments their lives serves to brighten their existence more than a panoramic acquaintance with science and literature and political movements would have done.

Professor M. H. Bryan, author of "Contemporary Georgia," has commented for the present report on some of the immediate problems that confront the state. And he has pointed out some pertinent guides for education. Because his remarks support the most imminent applications of the Milledgeville survey to education, they are quoted:

The problems of Georgia, in so far as they are more severe than those of other states, seem to arise from the state's poverty. It is probably fair to guess that Georgia has been going seriously in debt on balance. Without any large, obvious tendency for this situation to be remedied by the natural forces of economic adjustment, it is necessary, unless the difficulties are to get considerably worse before they get better, to look about for policies that may be helpful. The most promising immediate development is toward a material rise in Georgia's standard of living by the home-and-community production of the goods requisite for an adequate standard of living; and increased home production might very well correct the probably adverse trade balance.

There is a good deal of evidence developing that many types of production that have in the past generation been removed from the home and community can be more cheaply carried on there. It is to be remembered that factory production not only involves the cost of fabrication but the additional costs of assembling raw materials and of selling and distributing the product. There is also considerable evidence developing that electric power will in many lines permit genuinely efficient production on a household and community basis.

Real progress in the direction of home-and-community production and in the direction of a more nearly self-sufficient agriculture will require at least two basic reforms. First of all, it will be necessary to make rapid inroads on tenancy, since tenant farmers are without the fundamental economic incentives that would bring about the far-reaching reforms of agricultural practice required by a live-at-home, self-sufficing, soil-building agriculture. Secondly, we must face the fact that the skills necessary for a widespread live-at-home practice have, during the past two generations, largely evaporated in the generality of rural communities. It will be necessary to reform the educational program all along the line with the idea of redeveloping these skills in directions in which a live-at-home policy once more appears economically feasible.

So far as the writer is personally concerned, he would like to see the whole educational curriculum, especially from the secondary schools down, overhauled in the direction of giving the mass of the population those elements of practical culture requisite to a successful life in their environment rather than the elements of literary and academic culture that seem thus far to have been irresistibly enticing to our educational administration.

THE 1936 COLLEGE SOPHOMORE PROGRAM

No test or examination is complete once its content has been decided upon. There remains the matter of norms. The inescapable obligation of those who make tests must be to see that they are extensively and representatively used. The value of the American Council Psychological Test would be materially lessened if thousands of students had not been measured on it. In 1935, for example, the norms for the college form of the test were based on the scores of more than 50,000 students. Thus, a percentile rating of 50 means that the students who made that score stand exactly in the middle, as far as ability goes, of all the thousands of students who were tested.

It is the same with other kinds of tests. They are valuable only in so far as the norms for them are representative. For example, meaning must be given the Co-operative Achievement Tests by wide use among representative student groups. Since 1933 when the first high school and college forms of the tests appeared, their use has spread in ever-widening areas, and norms on them have thus been made more significant. Between July, 1935, and May, 1936, more than 700,000 of these examinations were given to students in 46 states, the District of Columbia, and Canada. The test makers are acutely conscious of the fact that this is only a beginning; and they are equally aware of the need for extensive help from schools and colleges in refining these instruments for measuring learning.

Since norms are an integral part of tests, the American Council has sought to get them, in part, through organized programs of testing. Yearly since 1932 the colleges of the nation have been invited to give a battery of tests, selected from the list available, to entering freshmen; and from the reported results norms have been established and supplied to the participating schools. Likewise the colleges have been invited to test their sophomores on examinations of general and special knowledge. This period in a college course is a particularly critical one, since specialization for professional

work begins usually in the following year. Norms in general and special fields of learning, together with local and regional information about community needs and opportunities for specifically trained graduates constitute one of the most helpful guides for colleges, for their selection of courses and their selection of students. In this way colleges can better direct their efforts into channels that will contribute to the personal success and satisfaction of the individual student and to the general welfare of the community employing the college graduate.

In the spring of 1936, 101 colleges took part in the sophomore program, the tests being selected at the option of each institution from the list provided by the Co-operative Test Service. Favorite examinations were English, literary acquaintance, general culture, contemporary affairs, general science, general mathematics, world history, chemistry, zoology, botany, physics, French, German, Spanish, and Latin. Not all colleges used all of the tests for their sophomores, but nearly all used more than one; and several colleges gave some of the tests to all four classes. Percentile tables and graphical and tabular interpretation of the results are given in the final sections of this report. Abbreviated percentile tables have been included for liberal arts colleges, teachers colleges, and junior colleges; for students of foreign languages having had from one to four years of preparation; and for each of the college classes, freshmen, sophomore, junior, and senior. (Tables 1 to 5.)

The statement has already been made that the groups tested in any one subject, save perhaps physics, are no more than approximately representative of all college sophomores. But with the limitations of sampling in mind, it may be well to consider the significance of the results as far as they can be interpreted with reasonable caution.

In recent years the colleges have been charged with many sins. They have been damned for clinging to units and credits as a measure of achievement; for assuming that time spent in courses of study brings proportionate dividends in

TABLE 1.—National percentile scales for the tests given in April and May, 1936, to college sophomores. The scales are based upon returns from all sophomores tested, regardless of curricular division or type of institution, for whom reports were received up to June 9, 1936. These tables show true percentiles, calculated from the distributions of scores.

Each score in each column shows the upper score limit of the percentile indicated at the extreme left and right of the line. For example, the bottom entry in the history and social studies column shows that all scores of 19 or below have a percentile value of 1; all scores from 20 to 23, inclusive, have a percentile value of 2; and all scores above 168 have a percentile value of 100. Many colleges used different combinations of tests, hence the numbers of cases and of colleges vary from column to column. The mean and sigma of the scores and the number of colleges involved in each column are shown at the top of each column.

	Hist. & S. S.	For. Lit.	Fine Arts	Total Gen. Cult.	Eng. Usage	Spell.	Vocab.	Total English	Lit. Acq.	
No. of Cases	4,951	4,951	4,951	4,951	5,026	5,026	5,026	5,026	4,044	
No. of Colleges	56	56	56	56	58	58	58	58	53	
Mean	76.5	38.6	35.5	150.6	68.1	34.1	50.4	152.6	60.3	
Sigma	32.3	23.8	23.7	68.4	16.9	13.0	17.4	40.7	26.3	
Percentiles										Per-centiles
100	227	219	153	580	105	55	98	249	170	100
99	168	116	109	358	98	54	87	228	131	99
98	154	102	98	325	96	53	85	223	121	98
97	147	94	92	307	95	53	83	219	117	97
96	142	88	87	291	93	51	81	217	112	96
95	136	83	82	278	93	51	79	214	108	95
94	132	79	78	270	92	50	78	212	105	94
93	128	76	75	263	91	50	77	209	103	93
92	125	73	72	255	90	50	76	208	100	92
91	123	71	70	248	90	50	75	206	98	91
90	120	69	68	241	89	49	74	205	96	90
88	116	65	64	229	88	49	72	201	92	88
86	112	62	60	221	87	48	71	198	89	86
84	109	60	57	214	85	48	69	196	87	84
82	106	57	55	208	84	47	68	193	84	82
80	102	55	53	201	83	46	66	191	82	80
75	95	50	48	188	81	45	63	184	77	75
70	90	46	44	176	79	44	60	178	72	70
65	85	43	40	166	77	42	57	172	68	65
60	81	40	37	156	75	40	55	166	64	60
55	76	37	34	147	72	38	52	161	61	55
50	72	34	31	139	70	37	50	156	57	50
45	69	32	29	132	68	35	48	150	54	45
40	65	29	26	124	65	32	45	145	51	40
35	61	27	23	117	62	30	43	137	48	35
30	57	24	21	110	59	27	40	130	44	30
25	53	22	18	101	56	25	38	124	41	25
20	48	20	16	93	53	22	35	116	38	20
18	47	18	14	90	51	20	34	112	36	18
16	45	17	13	86	49	19	32	109	34	16
14	43	16	12	83	48	18	31	105	32	14
12	41	15	11	79	46	16	29	101	30	12
10	39	13	9	74	44	15	28	97	28	10
9	37	12	9	72	43	14	26	94	27	9
8	36	12	8	70	42	13	25	91	26	8
7	35	11	7	67	41	12	24	87	25	7
6	33	10	6	63	40	11	23	84	23	6
5	31	9	5	60	38	10	22	80	22	5
4	29	8	4	56	36	9	20	76	20	4
3	27	6	3	51	34	8	19	72	18	3
2	23	5	2	46	31	6	16	65	16	2
1	19	2	1	40	27	4	13	57	13	1

TABLE 1.—*Continued*

	CONTEMPORARY AFFAIRS			Gen. Sci.	Gen. Math.	World History	
	Part I	Part II	Total				
No. of Cases	3,322	3,322	3,322	5,897	676	1,040	
No. of Colleges	39	39	39	52	21	18	
Mean	61.8	49.1	111.0	55.4	53.0	38.3	
Sigma	33.1	29.4	54.0	27.1	28.2	22.5	
Percentiles							Percentiles
100	203	184	364	194	132	135	100
99	159	139	262	137	125	103	99
98	143	128	244	127	118	95	98
97	136	120	234	120	114	90	97
96	131	113	225	115	109	85	96
95	126	108	217	110	107	81	95
94	122	103	207	105	104	78	94
93	118	99	201	102	102	76	93
92	114	95	195	98	99	73	92
91	112	92	191	96	97	71	91
90	109	89	187	93	94	69	90
88	104	85	179	88	90	65	88
86	100	81	171	85	87	62	86
84	96	77	164	82	85	59	84
82	91	74	159	79	82	57	82
80	89	71	153	76	79	55	80
75	81	64	141	70	72	51	75
70	74	59	132	64	65	47	70
65	69	54	123	60	60	44	65
60	64	51	116	57	56	41	60
55	60	47	109	53	51	38	55
50	56	43	102	50	48	35	50
45	52	40	96	47	45	32	45
40	48	37	90	44	41	29	40
35	44	34	84	42	38	27	35
30	41	31	78	39	35	24	30
25	37	28	71	36	31	21	25
20	33	25	65	33	27	18	20
18	31	23	62	32	26	17	18
16	30	22	59	30	25	16	16
14	28	20	56	29	24	15	14
12	26	19	53	27	22	14	12
10	25	17	50	26	20	12	10
9	24	16	47	25	19	11	9
8	22	15	45	24	18	11	8
7	21	14	43	23	17	10	7
6	20	13	41	22	16	9	6
5	19	12	40	20	15	8	5
4	17	10	36	19	14	7	4
3	15	9	33	17	12	6	3
2	13	7	28	15	11	5	2
1	10	4	21	11	7	2	1

learning. Many unfriendly critics of education, on too hasty and too prejudiced examination of the facts, have concluded that in general freshmen know more than seniors and that worth while learning and the ability to use it are inversely related to years of study in academic circles. Some educa-

TABLE 2.—College sophomore percentiles for indicated tests and types of colleges. This table, while abbreviated, is parallel to Table 1 and is to be read in the same way.

LIBERAL ARTS COLLEGES

	General Culture	Total English	Literary Acquaintance	Contemporary Affairs	General Science	
No. of Colleges.	37	39	33	23	34	
No. of Cases...	3,805	3,840	2,988	1,894	4,270	
Mean.....	156.2	152.3	62.6	112.8	56.0	
Sigma.....	70.7	40.7	26.6	51.4	28.1	
Percentiles						Percentiles
100	581	249	170	334	194	100
98	337	224	124	244	129	98
93	272	210	106	196	105	93
90	253	205	99	183	95	90
84	222	196	89	162	83	84
80	209	191	85	152	78	80
75	195	184	79	142	71	75
70	183	177	75	133	66	70
60	162	166	66	119	57	60
50	145	155	59	107	51	50
40	129	143	53	94	44	40
30	113	130	46	83	39	30
25	105	124	43	76	36	25
20	96	116	40	68	33	20
16	89	109	37	63	30	16
10	75	96	31	53	25	10
7	70	87	28	46	22	7
3	54	71	21	35	16	3
1	41	56	16	21	10	1

TEACHERS COLLEGES

No. of Colleges.	5	6	6	6	6	
No. of Cases...	717	909	769	1,074	1,070	
Mean.....	129.3	154.8	52.9	107.8	51.0	
Sigma.....	55.7	40.6	24.8	59.2	22.5	
Percentiles						Percentiles
100	327	240	130	329	163	100
98	275	224	109	248	112	98
93	220	209	94	213	87	93
90	206	205	88	198	80	90
84	184	197	77	172	71	84
80	173	193	73	160	66	80
75	162	187	69	143	62	75
70	151	182	65	129	58	70
60	135	170	58	108	53	60
50	121	159	52	94	48	50
40	109	147	44	81	43	40
30	96	132	38	69	38	30
25	90	124	34	63	35	25
20	83	116	29	57	33	20
16	76	110	27	53	31	16
10	64	101	22	44	27	10
7	57	89	19	39	24	7
3	45	74	13	28	19	3
1	34	58	9	18	13	1

TABLE 2.—*Continued*

JUNIOR COLLEGES

	General Culture	Total English	Literary Acquaintance	Contemporary Affairs	General Science	
No. of Colleges.	14	13	14	10	12	
No. of Cases...	429	277	287	354	558	
Mean.....	137.0	149.2	56.1	110.8	59.8	
Sigma.....	56.8	40.6	22.2	51.0	27.2	
Percentiles						Percentiles
100	435	240	133	364	158	100
98	268	219	109	239	124	98
93	223	208	88	192	105	93
90	213	201	85	181	99	90
84	192	191	78	158	87	84
80	182	184	73	149	82	80
75	169	178	70	135	77	75
70	158	174	67	126	71	70
60	142	162	61	112	62	60
50	132	153	54	103	55	50
40	120	143	48	92	49	40
30	104	128	43	81	43	30
25	96	122	41	75	39	25
20	90	113	39	71	36	20
16	83	105	34	66	34	16
10	71	89	30	56	30	10
7	64	83	24	47	27	7
3	49	70	16	36	21	3
1	30	52	12	28	15	1

tors have gone so far as to say, "Well, let's close up shop. We're making progress backwards."

The facts are not nearly so discouraging as critics and pessimists would have us believe. As far as present data are representative of the truth, freshmen do not know more than seniors; and they do not have better ability to apply what they know. Anyone who reads the percentile table for the colleges that tested their students from the freshman to the senior class can readily see that the averages for successive years in college show distinct progression upwards.

This average improvement is not only true for tests in general culture, English, literary acquaintance and contemporary affairs; it is also true for the foreign languages, French, German, Spanish, and Latin. (Tables 6 and 7.)

TABLE 3.—Foreign language test percentiles for indicated credit groups, including students from all four college classes. This table is to be read in the same way as Table 1. In view of the small numbers of cases, the percentiles are here given in abbreviated form.

	FRENCH				GERMAN			SPANISH			LATIN			
Years of College Credit	1	2	3	4+	1	2	3	1	2	3+	1+2	3	4+	
No. of Cases	307	473	237	40	171	229	39	85	118	61	74	81	109	
No. of Colleges	22	29	18	11	16	19	9	9	11	7	21	13	14	
Mean	78	120	139	178	63	80	144	64	86	130	103	142	152	
Sigma	46.9	52.3	47.9	55.3	37.5	45.3	60.6	44.5	48.1	66.2	54.8	55.9	58.5	
Percentiles														Percentiles
100	243	259	248	267	230	209	263	204	251	277	232	289	287	100
98	189	236	232	266	144	188	261	200	203	276	222	261	267	98
93	158	206	212	255	126	163	236	140	171	219	194	222	243	93
90	145	194	201	250	117	154	227	127	165	214	179	209	225	90
84	123	174	189	236	101	127	206	108	138	202	170	196	212	84
80	115	165	184	227	94	115	201	95	130	197	156	189	200	80
75	106	157	177	222	86	102	186	88	113	179	146	182	193	75
70	99	146	168	212	78	94	176	79	94	175	132	177	186	70
60	83	130	155	200	68	80	162	67	86	149	115	154	168	60
50	72	117	140	186	57	69	146	55	77	134	96	145	152	50
40	62	101	126	170	49	64	128	47	70	102	77	123	145	40
30	49	88	108	157	41	52	101	33	58	74	70	108	127	30
25	42	81	103	140	37	48	96	29	50	70	56	100	106	25
20	36	71	91	117	31	43	82	26	46	63	49	91	94	20
16	31	65	84	112	25	36	78	19	42	58	46	79	85	16
10	23	55	76	100	19	28	69	13	32	48	38	63	68	10
7	18	48	70	97	16	25	64	10	27	45	32	58	65	7
3	9	37	57	81	9	18	60	6	20	27	22	37	43	3
1	3	24	45	37	5	10	6	4	16	23	13	32	35	1

The facts that have caused confusion and grave misunderstanding are not concerned with average improvement for increasing years of study but with the variable nature of this improvement. On the average, students who study French for four years know more about the language each succeeding year, but many individual students do not measure up to the average. In spite of this fact, they are allowed, and often times are encouraged, to keep on trying, even after they have reached the limit of their ability to learn. The presence of such students in classes depresses average achievement and gives rise to just criticism from those who expect education to produce results, and not merely to mark time.

Again, some critics of college education would have us believe that all students of little or no ability are concentrated in a few colleges and that our future Edisons and Einsteins are being nurtured within the walls of a few highly selective institutions. Such is not the truth. Moreover, this point of view is a breeder of intellectual snobs, a most offensive cult.

TABLE 4.—Freshman, sophomore, junior, and senior class percentiles based on all returns from six colleges that gave the tests to all four classes.

	TOTAL GENERAL CULTURE				TOTAL ENGLISH				LITERARY ACQUAINTANCE				CONTEMPORARY AFFAIRS			
No. of Cases.	604	397	298	310	427	267	197	205	426	268	195	206	485	302	208	181
Mean.....	124.5	147.4	181.2	176.8	132.3	150.8	159.8	163.1	48.4	55.3	65.8	62.9	107.8	128.7	139.3	138.7
Sigma.....	56.1	70.2	82.9	75.3	39.1	39.1	39.2	35.4	21.6	24.9	27.9	27.0	40.8	47.1	51.8	42.8
Class.....	Fr.	So.	Jr.	Sr.	Fr.	So.	Jr.	Sr.	Fr.	So.	Jr.	Sr.	Fr.	So.	Jr.	Sr.
Percentiles																
100	308	406	504	520	233	242	244	242	124	135	173	134	243	266	320	246
98	268	340	420	357	218	221	236	233	110	117	136	119	209	249	259	238
93	226	272	321	300	196	207	215	216	82	99	115	110	169	206	224	214
90	206	241	294	277	187	203	209	209	76	91	101	104	159	194	213	199
84	178	212	260	251	173	193	199	199	70	79	92	92	148	176	193	185
80	168	199	243	234	167	186	196	194	65	75	87	86	140	165	182	176
75	155	186	221	218	160	179	192	188	62	71	82	83	133	156	172	166
70	144	170	206	205	153	174	187	183	57	65	76	77	127	148	164	157
60	128	147	186	184	140	165	172	174	50	58	69	68	155	135	145	143
50	113	134	158	165	127	154	159	165	44	50	62	58	104	125	130	133
40	101	118	146	145	119	140	149	155	40	46	55	50	93	113	120	122
30	89	104	130	130	108	127	136	143	35	41	49	44	82	98	107	112
25	84	96	123	122	104	122	129	138	33	38	46	41	77	93	100	106
20	78	90	113	115	99	113	122	132	31	35	41	39	73	87	94	99
16	72	81	105	110	94	107	116	126	29	32	38	36	69	82	89	94
10	63	72	94	90	84	100	107	115	25	26	33	32	60	72	79	88
7	57	66	87	82	78	94	102	111	22	23	31	27	53	65	71	84
3	45	54	74	67	66	75	91	90	19	17	26	23	41	55	61	77
1	35	43	59	50	48	58	69	83	11	14	19	21	31	47	52	62

TABLE 5.—Percentile tables for chemistry, zoology, and botany tests. Because of the small numbers of cases, the percentiles are presented in abbreviated form. The tests were given at the end of the college year to students in elementary college courses in these sciences.

	CHEMISTRY TEST I			CHEMISTRY TEST II			CHEMISTRY TEST C				
	Secs. 1 & 2	Sec. 3	Total Score	Sec. 1	Sec. 2	Total Score	Sec. 1	Sec. 2	Sec. 3	Total Score	
No. of Colleges	13	13	13	7	7	7	39	39	39	39	
No. of Cases	454	454	454	384	384	384	1,465	1,465	1,465	1,465	
Mean	141.7	69.1	210.5	84.7	23.7	108.5	58.5	26.6	18.1	103.3	
Sigma	45.7	27.9	66.5	21.6	11.4	28.4	21.5	12.4	11.1	40.0	
Percentiles											Percentiles
100	283	140	412	130	60	188	130	62	62	245	100
98	237	124	354	118	49	158	108	53	45	199	98
93	215	113	316	110	43	149	94	46	36	168	93
90	207	109	302	109	40	145	88	44	33	159	90
84	189	102	278	106	35	138	80	40	29	143	84
80	180	96	270	105	33	135	76	38	27	136	80
75	172	90	255	103	31	131	72	35	25	129	75
70	165	83	241	101	29	127	68	33	23	122	70
60	149	74	226	95	26	119	62	29	20	109	60
50	138	67	206	90	23	111	57	26	17	98	50
40	126	60	189	81	20	102	52	23	14	90	40
30	116	52	169	73	17	92	46	20	11	80	30
25	110	48	160	68	15	87	44	18	10	75	25
20	100	44	151	64	14	82	40	16	8	69	20
16	95	40	144	61	12	78	37	14	7	64	16
10	85	34	127	53	10	71	32	11	4	55	10
7	79	30	117	48	7	64	28	9	2	48	7
3	59	22	94	41	5	55	22	5	1	36	3
1	52	11	82	32	1	47	15	1	0	30	1

	ZOOLOGY TEST C				BOTANY TEST C				
	Section 1	Section 2	Section 3	Total Score	Section 1	Section 2	Section 3	Total Score	
No. of Colleges	21	21	21	21	11	11	11	11	
No. of Cases	759	759	759	759	284	284	284	284	
Mean	56.1	27.0	16.9	100.1	33.6	19.1	21.6	73.4	
Sigma	21.2	13.7	11.1	42.1	16.6	13.8	14.1	39.6	
Percentiles									Percentiles
100	129	58	57	233	90	56	78	205	100
98	100	51	43	187	73	50	55	170	98
93	91	47	35	162	62	42	45	136	93
90	85	45	32	158	56	39	41	127	90
84	78	42	29	144	50	34	36	115	84
80	74	40	27	138	48	32	33	108	80
75	71	38	24	131	45	30	30	101	75
70	68	36	22	124	42	27	28	93	70
60	61	31	19	109	36	21	22	80	60
50	55	27	16	98	31	18	19	65	50
40	49	24	12	87	26	13	16	54	40
30	43	19	10	74	22	9	13	46	30
25	39	17	8	68	21	8	12	42	25
20	37	14	7	61	19	5	10	38	20
16	35	12	6	55	17	4	9	34	16
10	30	7	3	45	14	2	5	29	10
7	27	5	2	41	12	1	4	26	7
3	19	1	1	28	10	0	2	19	3
1	13	0	0	16	5	0	0	11	1

TABLE 6.—Distribution of college sophomore averages. The sophomore means of all colleges for which data were available are here distributed in terms of national sophomore percentiles. The percentile scale has been altered, so that the intervals correspond approximately to a sigma scale. The vertical distances are therefore roughly comparable.

Natl. Soph. Percentiles	Age	Hist. & S. S.	For. Lit.	Fine Arts	Total Gen. Cult.	Eng. Usage	Spell.	Voc.	Total Eng.	Lit. Acq.	CONTEMPORARY AFFAIRS			Gen. Sci.	Gen. Math.	Natl. Soph. Percentiles
											I	II	Total			
98–100																98–100
96– 97	1															96– 97
94– 95				1		1						1				94– 95
92– 93				1												92– 93
88– 91												1	1			88– 91
84– 87	1		1	1	1						1	1	1	1	1	84– 87
79– 83	2	2	7	2	3	1			1	1	3	2	1	3	4	79– 83
73– 78	1		2	5	7	2	1	3	2	4	3	5	4	3	1	73– 78
66– 72	4	7	5	4	10	3	1	2	4	10	4	1	3	5	3	66– 72
58– 65	8	9	8	5	11	6	1	7	5	9	6	3	9	11	3	58– 65
50– 57	7	13	13	7	14	7	15	12	11	6	7	8	1	10	3	50– 57
42– 49	9	13	11	16	5	11	12	11	8	11	5	3	6	8	4	42– 49
34– 41	9	8	4	9	5	14	20	19	19	6	3	5	7	7		34– 41
27– 33	6	1	1	4		9	5	3	5	5	6	5	2	3	2	27– 33
21– 26	7	3	3	1		3	2	1	2	1	1	2	3			21– 26
16– 20	2		1				1		1				1			16– 20
12– 15	8													1		12– 15
8– 11	2					1						2				8– 11
6– 7																6– 7
4– 5																4– 5
2– 3																2– 3
1																1
Total.....	67	56	56	56	56	58	58	58	58	53	39	39	39	52	21	

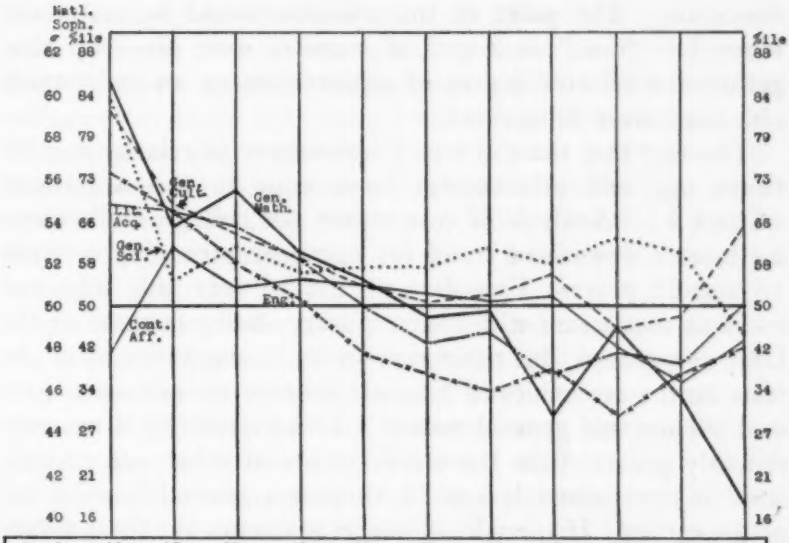
TABLE 7.—Distributions of college averages on the foreign language tests for indicated college credit groups. In computing college credits, one high school year was considered equivalent to one-half college year of credit. The numbers of cases on which the college averages are based range from 1 to 116; if all averages based on fewer than 5, or even 10, cases had been excluded, the relations indicated in this table would not be noticeably different.

The table is to be read as follows: In the 1 to 1½ year column for French, one college secured an average score between 140 and 150; two colleges secured averages between 120 and 130; and so on to the bottom of the column where it appears that three colleges secured averages of between 30 and 40 score points.

The vertical brackets at the right of each distribution indicate the 25th, 50th, and 75th percentiles from Table 3.

Score	FRENCH				GERMAN			SPANISH			LATIN				Score
	Years of College Credit														
	1-1½	2-2½	3-3½	4+	1-1½	2-2½	3-3½	1-1½	2-2½	3-3½	1-1½	2-2½	3-3½	4+	
260														2	260
250														1	250
240				1											240
230					1										230
220				2											220
210				1			1			1				1	210
200		1				1				1			3		200
190		1	1	2								1	1	3	190
180			1												180
170		1	2				1					2	1		170
160		1	4	1		1	1		1			1	1	1	160
150		3	1			1						1	1	1	150
140	1	3	1	1	1		1		1	1	1	1	2	3	140
130		2	2	2		1		1					1		130
120	2	4							1		1	1			120
110	1	2	3				1			1			2		110
100	2	3		1			1	1		1	1	1			100
90		2			1	3	1		1	1		2		1	90
80	1	2	1			4		1	2	1			1		80
70	4		1		1	3	2	2	1			2			70
60	1	2			3	1			3						60
50	4	2	1		1	1		1	1			2			50
40	3				4	3		2			3			1	40
30	3				2			1			1				30
20					1										20
10					1										10
0															0
Total Colleges	22	29	18	11	16	19	9	9	11	7	7	14	13	14	

The facts which erroneously give rise to such criticisms reside in tables of college averages. Inspection of sophomore averages on general examinations, and tests in foreign languages can be very misleading. These averages obscure the tremendous variability in achievement that goes to make them up. In virtually every college and every college class there are unusually brilliant students and unusually dim-witted ones, academically speaking. The range of ability actually extends, sometimes, from border line feeble-mindedness on the one hand to genius on the other. Averages, therefore, have a



Age Group	16	17	18	19	20	21	22	23	24	25	26+
No. of Cases:											
Gen.Cult.	2	93	680	1817	1302	472	223	89	49	34	85
Tot.Eng.	4	93	651	1698	1282	494	244	92	51	39	84
Lit.Acq.	3	81	556	1391	1055	400	202	72	42	34	73
Cont.Aff.	3	61	447	1088	828	317	174	66	38	28	73
Gen.Sci.	1	44	419	1377	1016	393	202	90	48	37	93
Gen.Math.	1	8	79	223	199	72	47	20	8	5	13

CHART I.—Comparison of age groups. Means of chronological age groups of sophomores on indicated variables, graphed in terms of national sophomore percentiles. Since the national distributions show varying degrees of positive and negative skewness, the means as here graphed appear too high for some variables and too low for others. However, it is the direction of the lines, rather than their height on the chart, that is significant here.

limited significance. Business men would be less inclined to judge a college on its average scores in English, mathematics, or physics than on evidence that students are continued in courses only so long as they show improvement. And they would doubtless look with favor on colleges that kept "cost accounting" records in the fields of learning.

In foreign languages, for example, it is apparent from the overlapping of college averages that many students with only a year to a year and a half of course work know more about the language they are studying than others who have had four years or more of study. It is this variability in achievement when amount of study time is kept constant that has given rise to the severest strictures against the value of college

education. The point of the criticism would be materially blunted if "time" as a unit of measure were given up altogether and relative degree of achievement on an understandable scale were substituted.

The fact that there is a very low degree of relationship between age and achievement lends edge to this argument. (Chart I.) Analysis of test results for college sophomores discloses a downward trend for age groups ranging between 16 and 26 years. True enough, the 16 year olds seem not to be as conversant with contemporary affairs as some of the later age groups, but their superiority is unquestioned in the tests on the mechanics of English, literary acquaintance, general science, and general culture. This superiority is not consistently greater than the achievements of other age groups, since at approximately age 22, there is a general fanning out of the curves. If specialized interests account for these divergences, they have not been powerful enough to bring the older students nearer than within bowing distance of the youngsters. It is very likely that these 16 year olds are in college because they have been blessed with a peculiar kind and degree of natural endowment; and natural endowment seems to be but little affected by the dignity of years. Admittedly, the tests measure intellectual achievement and not *savoir faire*. Tests of the latter commodity are much needed.

Scores made by individual students, regardless of age, are one of the most important factors contributing to individual diagnosis and guidance. The tests used and the various scales of values or norms available for them will place the student in his relative position in the standard groups. In some colleges a student might achieve the 80th percentile on local norms but only the 15th percentile on national norms; or at another college, the reverse might hold true. But to know the ranking, both local and national, is of inestimable help to the adviser for educational and vocational guidance.

The individual scores of students are especially important for the counsellor or adviser. Average college scores, carefully interpreted, can be uniquely important to the administra-

tor. Correlations between pairs of college averages, made possible by the fact that many colleges take part in the sophomore program annually, suggest that levels of achievement in colleges stay fairly constant. (Table 8.) For example, if a college gives the sophomore tests in any given year, the chances are good that the average score for the next sophomore class will be about the same. With the help of a statistician college administrators can learn considerable about the mental characteristics of their students, how they compare in central tendency and variability with other students, and how far mastery of a subject has been carried by groups. Thus far norms for professional goal groups have not been adequately determined, but such information as there is suggests the presence of important differences. (Chart II.) Differences between such groups should be administratively significant for the selection of students and for their guidance, once they are found to be stable.

Perhaps nationally used tests are used most extensively for individual guidance. But their value for curriculum building cannot be denied. Tests cannot and should not be used in themselves to shape a curriculum, or to give it rigidity. They can be used to evaluate its effectiveness and to show, at least, what not to do. For example, certain subjects like the foreign languages, mathematics, and physics have little value, aside from a doubtful disciplinary one, unless they are thoroughly mastered. A student who reads German at the rate of an inch an hour, and that badly, or who fumbles helplessly with equations despite several high school and college years of training, has been studying the wrong thing for him. And if a considerable percentage of his classmates are his brothers under the skin, something is wrong with the curriculum.

In a very real sense the junior college movement and the recent mushroom growth of the so-called survey courses are an admission that the traditional curriculum is hopelessly inadequate for large numbers of college students. The reforms are admirable in their objectives, for the most part. They will be equally admirable in their outcome if, all along

TABLE 8.—Correlations between 1935 and 1936 sophomore averages of colleges that participated in both programs, with corresponding correlations for 1934-35, 1933-34, and 1932-33. Data on some of the variables were not available for all colleges, hence the numbers of pairs of averages vary from test to test.

Variable	N (No. of Pairs of College Averages)	Correlations 1935–36	CORRESPONDING CORRELATIONS		
			1934–35	1933–34	1932–33
Chronological Age.....	45	0.81	0.75	0.85	0.82
History and Social Studies	40	0.61	0.80	0.83	0.65
Foreign Literature.....	40	0.84	0.90	0.91	0.54
Fine Arts.....	40	0.89	0.90	0.90	0.68
Total General Culture....	40	0.81	0.88	0.90	
Usage.....	41	0.85	0.81	0.76	
Spelling.....	41	0.83	0.77	0.74	
Vocabulary.....	41	0.79	0.88	0.77	
Total English.....	41	0.88	0.88	0.79	0.68
Literary Acquaintance....	35	0.80	0.69	0.74	
Contemporary Affairs....	23	0.92	0.71		

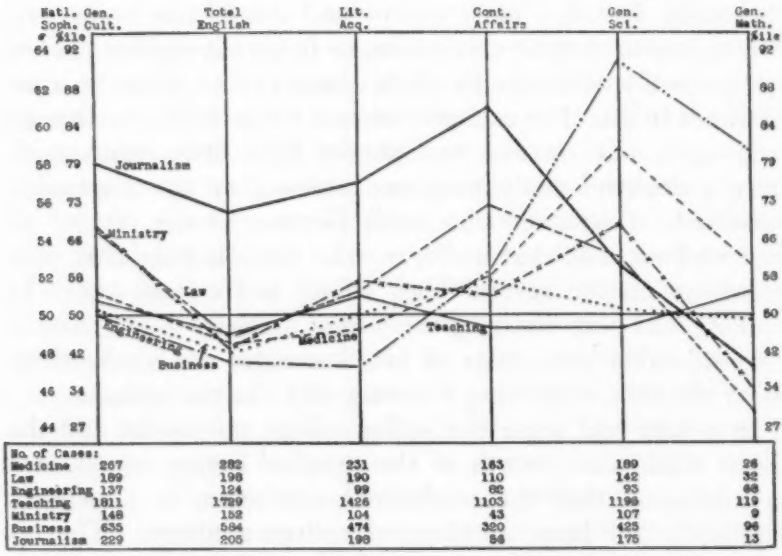


CHART II.—Comparison of professional goal groups. Graphs of means on indicated tests of college sophomores who reported their professional goals. The averages are graphed in terms of national sophomore percentiles.

the line, objectives and results are subjected to scientific scrutiny, and if the indications of scientific analysis are put into effect. Such a scientific approach to setting up educational values depends on extensive, large-scale co-operation among educators. And various kinds of testing programs will be instrumental in furnishing the materials for setting standards. The sophomore program, as one of the early spurts of interest in this direction, has been of greatest value perhaps in stimulating sister programs. Already numerous state organizations have programs well under way or in an incipient stage. Several have come into being since Dean McConn made his report.[4]

In Maine, Texas, and South Carolina, for example, co-operative programs are focusing the interest of high schools and colleges. Pharmacy District No. 2, with 17 colleges, and the Eastern States Teachers College Association, with many more, are directing their efforts toward five-year programs designed to shed light on the question of selection and standards in the respective professional groups. At present the Committee on Standards of the Southern Accrediting Association has under advisement a plan for adding a testing program to the procedures already in use for accreditation.

Whether testing programs are new born or have reached a more advanced stage of maturation as in Minnesota, Iowa, and Kentucky, their importance does not reside in the tests themselves nor in the number and variety used. They are primarily significant because they are gradually doing for *examining* what has already been accomplished for *examinations*. The measurement and guidance function, widespread and important as it is, has nevertheless been a stronghold of educational anarchy in which each examiner and counsellor has gone his own way flying the banner of "every man a king." Co-operative effort has injected a genuinely democratic element into the scope and the content of examinations; and co-operative programs of using test results are lending

[4] Max McConn, "Educational Guidance Is Now Possible," EDUCATIONAL RECORD, October, 1933, p. 475.

educational and social significance to the meaning of guidance and curriculum building. This is their real contribution.

SCIENCE TESTING PROGRAMS IN COLLEGE

That examining and guidance are conceived to be democratic rather than individualistic functions is attested by the fact that several of the national scientific associations have standing committees at work on tests and test uses. Co-operative relations among representatives from the fields of mathematics, chemistry, zoology, and physics and between these groups and the American Council have for some time been established. Except in the case of physics the programs are restricted to tentative, experimental work; but they have been extended and promise continued development. Within a reasonable length of time they should be as extensive as the physics program has become under the direction of the American Association of Physics Teachers.

The fact that 227 college departments of physics co-operated in the program for the past year, and the fact that the program has been operating on an equally large scale for three years make it of particular interest. The democratic nature of the project is one of the most promising aspects of American education. In the major divisions of elementary physics, the committee on test content made a composite of fifteen textbooks and drew the materials for the examinations from the common content thus revealed. The *American Physics Teacher,* September Supplement, 1936, carries a detailed account of the program.

A most significant feature of the work is that two forms of the tests have been released each year, and departments have been invited to use one before students begin the study of physics and the other after they have completed the course. Analysis of the results shows that on the average students having had high school physics know more to begin with and make greater gains than students who start their study of physics in college. Such facts are a direct answer to those who regard the teaching of physics as a waste of time and who

erroneously believe that teaching and extent of course work have no relation to learning. The large-scale teaching of physics is thoroughly justified if an average amount of gain in learning is the criterion. Students do learn, and they learn a lot.

But not all of them. Here is the critical issue for education. Some students with both high school and college credits in their account have actually accumulated nothing but the credits; they have a set of inflated assets with no substance behind them. And yet they have been permitted to continue a study that utterly baffles their power to learn. This is serious and unpardonable waste. On the other hand, some few students, with or without high school credits in their lockers, demonstrate a greater knowledge of the subject before they study it in college than the majority have after study. Such students, forced into the child's play of learning what they already know, easily get habits of laziness and develop attitudes of contempt. This, again, is educational waste.

The physics program as a collective and democratic movement is helping to set standards of achievement. It is furnishing the scale whereby the schools can honestly look toward judging the effectiveness of their teaching and curricular programs. No teacher single-handed can do this. Amount and extent and validity of learning cannot be measured in the absolute. We have made the mistake of believing that they can and that two equally able teachers in different colleges judge the performance of their respective classes of thirty students on the same standards. Any standard that will "stay put," that will remain sufficiently stable to be used again and again, must be based not on a class or a college. It must rest on a large, representative group, because learning is *relative*. A physician, for example, who might be outstanding in a small city could easily drop back to a position much farther down the scale if he were ranked among doctors from Chicago or New York. It is not otherwise with students of physics.

The American Association of Physics Teachers is to be congratulated because it has applied one of its own principles in physics to the measurement of learning. It is setting

up standards against which to judge the value of its product. It is in the vanguard of those who conceive of education as an orderly, measurable process that develops the individual to his fullest capacity and that enables the community to take advantage of its best talent.

F. S. BEERS,
University System of Georgia

The Council at Work

THE Council at Work is a brief summary of the outstanding new projects in which the Council is interested, as well as a progress report on undertakings already launched. It is hoped that this survey will give to the members of the Council and those interested in its work a more intimate view of the Council's development. Individuals desiring further information regarding subjects mentioned in this section are invited to write to the offices of the American Council on Education, 44 Jackson Place, Washington, D. C.

MEMBERSHIP

AT THE meeting of the Executive Committee of the American Council on Education in Washington on June 27, 1936, seven new members were elected to the Council. The total membership now is Constituent, 29; Associate, 28; Institutional, 325; total, 382. The newly elected members are:

Constituent:

National University Extension Association

Associate:

Delphian Society
National Association of Deans and Advisers of Men
Pennsylvania Board of Presidents
Presbyterian Board of Christian Education

Institutional:

Kansas State Teachers College, Pittsburg, Kansas
Massachusetts State Department of Education, Boston, Massachusetts

THE FIFTH EDUCATIONAL CONFERENCE

The Fifth Educational Conference sponsored by the Cooperative Test Service of the American Council on Education, the Educational Records Bureau, and the Commission on the Relation of School and College of the Progressive Education

Association, will be held in New York City at the Hotel Roosevelt on October 29 and 30, 1936. A number of outstanding speakers in American education will address the conference and there will be a question and answer session and symposia of special interest groups. Registration can be made at the Hotel Roosevelt on the day of the meeting.

Dr. E. E. Day of the General Education Board will open the first meeting with an address on "Basic Responsibilities of General Education in the United States." President R. A. Kent of the University of Louisville, chairman of the American Council on Education for 1936-37, will speak at the luncheon session on "The Program of the American Council on Education." Other speakers on the first day include Dr. Francis Parkman, St. Mark's School; Mr. Burton P. Fowler, Tower Hill School; Dr. John M. Stalnaker, Princeton University; Dr. Richard M. Gummere, Harvard University; Dr. E. F. Lindquist, State University of Iowa; Dr. Richard D. Allen, Providence, Rhode Island; and Dean Max McConn, Lehigh University.

The second day meeting will begin with an address by Dr. F. P. Keppel, president of the Carnegie Corporation, on "The Arts in American Education." Dr. L. L. Thurstone, University of Chicago, will address the luncheon session on "A New Concept of Intelligence, and a New Method of Measuring Primary Abilities." At the dinner session on October 30, Dr. Edwin R. Embree, of the Rosenwald Fund, will speak on "Rural Education as a National Problem."

CO-ORDINATION IN TESTING

At its meeting in June, the Executive Committee accepted the report of the Committee on Review of the Testing Situation. The latter committee had worked for a year on the reorganization of the Council's testing activities. On the basis of the report, the Executive Committee established the Committee on Measurement and Guidance with the following members:

C. C. Brigham, Princeton University
W. W. Charters, Ohio State University
H. E. Hawkes, Columbia University, *Chairman*
E. R. Smith, Beaver Country Day School
G. D. Stoddard, State University of Iowa
A. L. Threlkeld, Superintendent of Schools, Denver, Colorado

This committee will co-ordinate all the testing activities of the Council and will be responsible for the development of new projects in the field of measurement and evaluation.

COMMITTEE ON MOTION PICTURES IN EDUCATION

A grant of $25,000 has been made by the General Education Board for the continuation of the study of the relation of motion pictures to education, a study in which the Council has been engaged for several years. The Executive Committee appointed the following committee to supervise this field:

John Abbott, Museum of Modern Art
W. W. Charters, Ohio State University
Ben G. Graham, Superintendent of Schools, Pittsburgh, Pennsylvania
Mark A. May, Yale University

A significant addition to the field of visual education was made by the committee and published by the Council in September of this year in the volume, *The National Visual Education Directory: Elementary and Secondary Schools.* The book, compiled by Cline M. Koon of the United States Office of Education and Allen W. Noble, was made possible through the co-operation of the United States Office of Education. It is a tabulation of the audio-visual equipment in 8,806 school systems in the United States. It presents information regarding the projectors, films, and radios available in the various schools, as well as the names of the individuals responsible for visual education. The book sells at $3.00 per copy and can be obtained from the Council.

AMERICAN YOUTH COMMISSION

In an effort to investigate more thoroughly the unemployment situation, the American Youth Commission held a joint

conference in New York last July with representatives of business, industry, labor, government, social welfare, and educational agencies participating. Two days were given to a discussion of the extent of unemployment among youth, causes of unemployment, ways of providing more employment for youth, types of training needed by youth for successful vocational adjustment, and how and by whom this training can be supplied. The conclusions will be released to the public at an early date.

Mr. Owen D. Young, vice-chairman of the Commission, presided. The following organizations were represented:

United States Department of Commerce
National Youth Administration—Advisory Council
National Youth Administration—Administration
American Association of Social Workers
National Conference of Social Workers
Community Chests and Councils
American Federation of Labor
National Association of Manufacturers
National Industrial Conference Board
United States Chamber of Commerce

At the May meeting of the Commission, Professor Harl R. Douglass of the University of Minnesota presented an exploratory paper on the problems in secondary education. Other exploratory papers have been prepared this summer, one on occupational problems by Dr. M. R. Trabue of the University of North Carolina. This autumn the problems of student health will be studied by Dr. Harold S. Diehl of the University of Minnesota and Dr. Charles E. Shepard of Stanford University.

The Commission's study of the Civilian Conservation Corps was started October 1 under the direction of Mr. Kenneth Holland, former C.C.C. educational adviser of the New England area. A grant of $77,800 has been received for this comprehensive survey of the program of the C.C.C.

FINANCIAL ADVISORY SERVICE

During the first year of the Financial Advisory Service, over one hundred institutions requested comments and suggestions

on the forms of financial reports they were using. Many institutions were visited by representatives of the Service while others corresponded with the Service concerning specific questions and problems of financial administration. At the present time the Financial Advisory Service is co-operating in a survey of the Agricultural and Industrial State Teachers College at Nashville, Tennessee.

Assistance of a more general nature was rendered through the publication of six Financial Advisory Bulletins, complimentary copies of which were sent to all colleges and universities, as well as to others who were interested. These Bulletins deal with the following problems:

Bulletin 1. College Finance.
Bulletin 2. Depreciation of Real Property in Educational Institutions.
Bulletin 3. The Balance Sheet in College and University Financial Reports.
Bulletin 4. Current Investment Practices of Colleges and Universities.
Bulletin 5. Current Practices of Colleges and Universities in Obtaining Professional Counsel and Services.
Bulletin 6. Fitting the Accounting System to the Plan of Reporting Recommended by the National Committee on Standards Reports.

The General Education Board has granted $32,000 for the continuation of the work of the Service for two more years. Additional space has been obtained for the central office, and the staff has been increased by the addition of a research assistant.

NATIONAL CONFERENCE ON EDUCATIONAL BROADCASTING

Dr. C. S. Marsh, associate director of the Council, is executive secretary of the conference on educational broadcasting which will be held in Washington, D. C., on December 10, 11, and 12, 1936. The conference, which will be sponsored by eighteen national organizations in co-operation with the United States Office of Education and the Federal Communi-

cations Commission, will serve as a clearing house for information on the latest technical and professional developments in the educational use of radio.

The tentative program includes such topics as schools of the air, radio music, speech and drama, religious broadcasts, forums on the air, organization of listening groups, radio workshops, broadcasting to schools, use of radio programs by colleges and universities, use of radio by libraries and museums, radio programs for children, problems of research in educational broadcasting, audience attitudes, educational broadcasting in other countries, and organization of the community on behalf of a radio station.

All organizations interested in radio as a social force, nationally or regionally, are invited to participate. The broadcasting industry will be represented. Government officials and prominent educators from America and foreign countries will take part.

A MANUAL OF EXAMINATIONS

An important contribution in the area of testing is the recently published report of the Council's Committee on Manual of Examinations. This report, *"The Construction and Use of Achievement Examinations; A Manual for Secondary Teachers,"* was prepared by a Committee under the chairmanship of Dean H. E. Hawkes. A number of distinguished experts in this field contributed to the volume. The book clarifies and puts into useable form the most recent findings on the factors that have been found basic in achievement examinations. It has been published by Houghton Mifflin Company, Boston, and sells at $2.40 per copy.

PROBLEMS AND PLANS COMMITTEE

The Executive Committee has elected Dean H. W. Holmes of Harvard University to serve for one year on the Committee on Problems and Plans in Education. This vacancy was created by the inability of Dr. C. H. Judd to serve.

CONFERENCES AND MEETINGS

The Council has been represented at the following meetings since June 1, 1936:

Catholic Hospital Association, Baltimore, Maryland
Conference on Secondary Education, Williamsburg, Virginia
Fifth International Conference on Public Instruction, Geneva, Switzerland
Harvard Tercentenary, Boston, Massachusetts
4-H Clubs of America, Washington, D. C.
Planning Committee of Sponsoring Organizations of the National Conference on Educational Broadcasting, New York, Chicago, and Washington, D. C.
Society for the Promotion of Engineering Education, Madison, Wisconsin

The president of the Council, Dr. George F. Zook, visited Alaska during the summer and gave some time to the study of the problems of public education in that territory. The associate director, Dr. C. S. Marsh, was one of the delegates of the United States to the Fifth International Conference on Public Instruction held at Geneva, Switzerland, July 13 to 17. The program of the conference is reported on page 547.

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